THE EVALUATION

OF

TRAINING COURSES

FOR

EXPERIENCED AGRICULTURALISTS

BY

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ABSTRACT

An evaluation of the effectiveness of a training course is very difficult to implement, but it is necessary if the course is to achieve the objectives set out by the course designers. When the participants have completed their training, they should be equipped with the knowledge of the latest developments in their discipline, the skills to be able to put them into practice and the attitude to utilise this training experience to the full in the farm or unit situation.

This study assesses the techniques available for evaluation and has selected one method of appraising Adult Short Courses, designed specifically for experienced agriculturalists from a particular farm discipline. The Agricultural Training Group Officer established the training needs of group members and organised a programme based at a central location and staffed by A.T.B. or external instructors. A questionnaire was administered to the population of course attenders at the end of each training day. The levels of knowledge, skills and attitudes were measured using a range of question designs and rating scales. The "before" level was valued at the same time as the "after" score. This is a departure from the more commonly used Pretest, Posttest design. Unit or farm physical performance data, related to stockperson control, was collected over the relevant years. A commercial psychological test was also used to evaluate the trainability of the course attenders.

A comparative group of experienced agriculturalists, who were not involved in any A.T.B. training related to their unit attachment, were contacted to provide similar information and reduce any maturation, historical and local errors.

The data collected showed significant increases in knowledge, skills and attitude levels with some degree of improvement in unit physical performance. The correlations between the objective criteria, unit physical data, and the subjective criteria, self-assessment ratings, were very mixed for the course attenders. The psychological tests tended to support independent unit manager valuations of the trainees.

The training courses were effective and the evaluation has shown that trained staff can improve unit physical performance. The analysis supported the methodologies employed and further testing, with some modifications, using a larger population involved in a range of farm disciplines would be useful.

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CHAPTER 1

INTRODUCTION

Truly the Politics of training is "the art of achieving what is possible", Harrison (1988).

This statement implies that there are many objectives and targets set by organisations and training is expected to assist in attaining these ends. The success rate depends upon accomplishing as much as possible given the resources available to the trainer and the trainee. The evaluation of training depends upon the techniques that are employed by the evaluator to measure the effectiveness of that training. Unfortunately there has been a lot of retoric and limited verification of the effectiveness of the training to the organisation and the individual. This has lead to many comments by researchers in this area of study.

In the field of training evaluation "when all is said and done, a great deal more is said than done. Indeed not all that much is said either," says Morris (1984).

However, there are many aspects of training to be considered and a review of the organisation and management of training by Johnson (1976), and later by Strayton (1985) considered the following points:

1.1. What Is The Role Of Training?

When there is a gap between actual performance and what is needed productivity and standards suffer. Training can reduce if not eliminate this gap. It does so by changing the behaviour of individuals, by giving them whatever additional

specific items of knowledge, skill or attitude they need to perform to that standard.

Changing behaviour, then, is the function of training. The terminal objective is to help achieve the goals of the organisation through optimum use of manpower.

1.2. What Problems can Training solve?

Training can solve a variety of manpower problems which militate against productivity. Problems occur within any group from unskilled to skilled and from lower to upper management. Possible problems are shown in Figure I.

Figure I Possible Symptoms which May Suggest a Training Need

OUTPUT	Low/falling
SCRAP/WASTAGE	High/rising
STANDARDS OF PERFORMANCE	Low/falling
TIME TO PERFORM TASKS	Long/rising
TIME TO LEARN HOW TO PERFORM TASKS	Long/rising
UTILISATION OF MACHINES AND EQUIPMENT	Low/falling
ACCIDENT RATE	High/rising
LABOUR TURNOVER	High/rising
ABSENTEEISM	High/rising
DELAYS	Excessive/increasing
DISPUTES	Excessive/increasing
CUSTOMER COMPLAINTS	Excessive/increasing
RECRUITMENT PROBLEMS	Continuing/increasing

Source: Boydell 1979

The solution requires individuals to add to their apperceptive backgrounds specific, identifiable items of additional knowledge, skill or understanding. These problems include needs to:

- increase productivity
- improve quality of work and raise morale

- develop new skills, knowledge understanding and attitudes
- reduce waste, accidents, turnover, lateness and other overhead costs
- fight obsolescence in skills, technology, methods, products, markets and capital management
- bring the incumbents to that level of performance which meets (100% of the time) the standard of performance for the job
- develop replacements, prepare people for advancement, improve manpower deployment and ensure continuity of leadership
- ensure the survival and growth of enterprise.

1.3. Where Can Training Become a Functional Part of the Organisation?

Training can become a functional part of the organisation anywhere. All that is needed is evidence that an operating problem exists which can be solved in whole or in part through structured and controlled training activities. For example:

(a) The new employee needs to be acquainted with the organisation's goals, policies, structure, products or services and a training department is best equipped to give such instruction - economically and uniformly via group sessions.

(b) A new policy is to be implemented. Supervisors need to be influenced by the policy and the people who structured the policy explain the need, answer questions and get feedback.

(c) A new procedure or a new machine is being introduced. Everyone is brought together for explanations, demonstrations, question periods, reactions and practice. Instruction is given by the producer of the new procedure.

(d) Quality of written reports, letters or other documents needs improving. All persons involved are scheduled into one or more training sessions in which they review or develop

standards, study or compose samples of desired material, practice, etc.

1.4. How Can Training Become a Functional Part of the Organisation?

Training becomes a functional part by improving productivity. Employee performance is the responsibility of the immediate superior/supervisor (reviewed in Kast 1985). The performance reflects the supervisor's interest in training and ability as a trainer. Hamblin (1974, 1985) discussed the levels of evaluation from reaction to ultimate value effects. Understandably, results will vary. They also are unpredictable. Instruction is usually informal with an "if, when and as needed" approach. It is often as immediate on-the-job application. It is often done on a one-to-one basis.

As an organisation grows so do the number of operating problems and the number of people needing guidance and help. The need is for a more formal, structured, controlled programme of manpower development. This usually gives rise to the appointment of an individual in charge of this training initiative. Certain questions must be asked:

- When is qualified manpower needed - today or tomorrow?
- What training can provide solutions to operating problems? (one way in Thorpe and Grugeon (1987))
- What kinds of training are already going on?
- When is training needed - today, next year or in the future?
- Will top management support a viable programme?

1.5. Policies and Organisational Attitudes

The function of a training manager is to co-ordinate the training programme from the personnel audit through to the employee evaluation after certain phases of the staff development. There must be a policy written in general terms to cover employee training.

Employee attitudes towards the training function are variable and depend on his or her personal perceptions and experience, Crowder (1989). Where no personal involvement occurs, then the feelings can mirror those put forward by the boss, peers and authoritative figures. A returning trainee who states: "Very good programme - I can use it" - will influence peers and others to a marked degree.

Top management can support a training function and middle management will decide to conduct specific programmes. The latter will determine how far training will get. Where it is based on a valid need, and is performance oriented with management having a voice in determining the issues, then attitudes will be supportive. "Training for training's sake" must be avoided if at all possible.

1.6. When is Training Justified?

Training is expensive on manpower, time, money, facilities, equipment and supplies. Despite the disruption to production, training may be justified on the following grounds:

- when there is no better way to solve the operating problem involved
- when other interventions have been considered and found less effective
- when training is performance oriented, Kast (1985)

- when changes in the behaviour of the trainees can be measured
- when new behaviours will be used on the job
- when the job environment will permit the use of new behaviours
- when training is limited to what is actually needed at a given moment is provided
- when the trainees can profit from the instruction
- when the trainees are in a state of readiness and each sees a personal advantage in completing the programme
- when the trainees can, and do, transfer their behaviours to the job

- when the programme has been carefully structured, objectives are valid and clear, instructors are capable, and equipment and facilities are adequate.

1.7. Who Determines When Training is Needed?

Training is the responsibility of management and the need for training is determined by the head of line management or department in which an operating problem exists. The training requirement is determined and organised to meet the problem identified. This assumes that there is no other intervention possible, eg better job planning, organising, controlling or changing a process. If an organisation is going to survive and grow, then there needs to be a growth in efficiency of the workforce. The optimum use of manpower is vital and constant attention to the growth needs of individual employees is very important. Many organisations augment the on-the-job supervision with formal off-the-job training.

1.8. How to Get Started

A study by the training manager should determine some of the following points, Schofield (1985):

- in what way is present employee performance inadequate?
- what new skills and/or knowledge are needed by what kinds of workers?
- what plans for changes in operations and work force expansion are proposed and require new abilities and insights? Can present employees be trained or retrained for new/upcoming jobs?
- what kinds of training are going on already?
- what do individual managers feel should be done to increase manpower productivity?
- in what order should these things be done?

Confidences must be respected and interviews need to be well prepared. Any recommendations must centre around:

- identification of apparent needs
- proposed ways to meet these needs
- suggestions for a timetable for implementing stages
- inclusion of other important items.

The training function needs to be organised carefully bearing in mind the size of the organisation and the individual or group being trained, Goodman (1989). In a one person training unit the work is often organised on a priority basis. Temporary help is recruited if the work load becomes too high. The management of the training function is a key element to the success of training. Each of the management functions must be handled skilfully. These include research, planning, scheduling, operating, controlling and evaluating. Revision of procedures may be required after a full evaluation. The

results are then reported to top management to assess the accountability of the training function. Harrison (1988) points out that line management are mainly responsible for ensuring that people are helped to perform their jobs effectively and efficiently and have the learning opportunities to develop their abilities and potential.

Research indicates that there is little real support for training as a board level responsibility or a major contributor to corporate goals. Support at other levels is also weak due to the attitudes expressed at top level.

The training role is usually that of passive provider with training officers having low-level status and their work confined to "reactive" training activities rather than an organised "proactive" staff development scheme. Widespread neglect of training and development in organisations, along with the lack of awareness of integrating work and training as a cheap, stimulating and effective way of continuously developing both, means that people are one of the most under-utilised resources, most organisations possess. This research study seeks to redress the balance and demonstrate the advantages of a fully researched, planned and controlled training programme for adult employees in the agricultural industry, McCormick (1976).

CHAPTER 2

THE TRAINING OF EXPERIENCED AGRICULTURALISTS

"The instinctive manager knows people make or break businesses, and that a good proportion of his time must be spent keeping people well briefed besides training, monitoring and encouraging them", Gadd (1989). The organisation that takes its people management policy seriously is one that should move forward effectively and efficiently, Bewley (1987).

2.1. Why Train Experienced Agricultural Employees?

Technological advances, computer aided recording schemes, new work schedules and high capital investment are but a few of the reasons for further training and briefing of employees on farms. The main area considered by this study centres around pigpeople on "Company" and large intensive units.

The applicability of this study centres around the large capital investment in these units, which is very high and the output per person, eg £130,000 output/person for "Company" pig unit, Gadd (1989).

Therefore any improvements in work practice, knowledge and attitudes should further add to this high level of achievement. Recorded data for the Meat and Livestock Commission (1990) shows the variation in pig unit performance for the following production and economic efficiency factors, Table 1.

Table 1. Meat and Livestock Commission
Pigplan Recording and Costing Scheme Results
(August 1990)

	Top third Producers	Average Producers	% Difference	
Pigs reared perlitter	10.08	9.59	+5%	)) Breeding
Mortality	11.0	12.0	-9%	)) Units
Litters per sow per year	2.33	2.21	+5%	))
Mortality	1.3	1.5	-15%	))
Feed conversion ratio	2.67	2.55	+5%	)) Finishing) Unit

There is a wide variation in farm and unit performance, and there are clearly areas for improvement. These may be in both the system (management decisions) and the employee influence (stockperson/worker decisions) upon that system. This study will concentrate on the latter as they were the trainees.

Cerutti, Canali and Verga (1987) have shown that the introduction of computer technology accompanied with stockperson training has improved the potential productivity of the large pig units studied. Stockpersons can be trained but at the same time need to be motivated to seek the knowledge, skills and attitudes to match the objectives of the organisation or farm for which they work.

2.2. What Training is Needed for these Agriculturalists?

This will vary considerably depending upon the age, experience and attitude of the employee and priority given to the training by the organisation/farm management team, Goodman (1989). As Knowles (1982, 1984 (a and b)) points out, "the adult learner is often a neglected species". They have a self-concept of their present state of ability which is often very difficult to

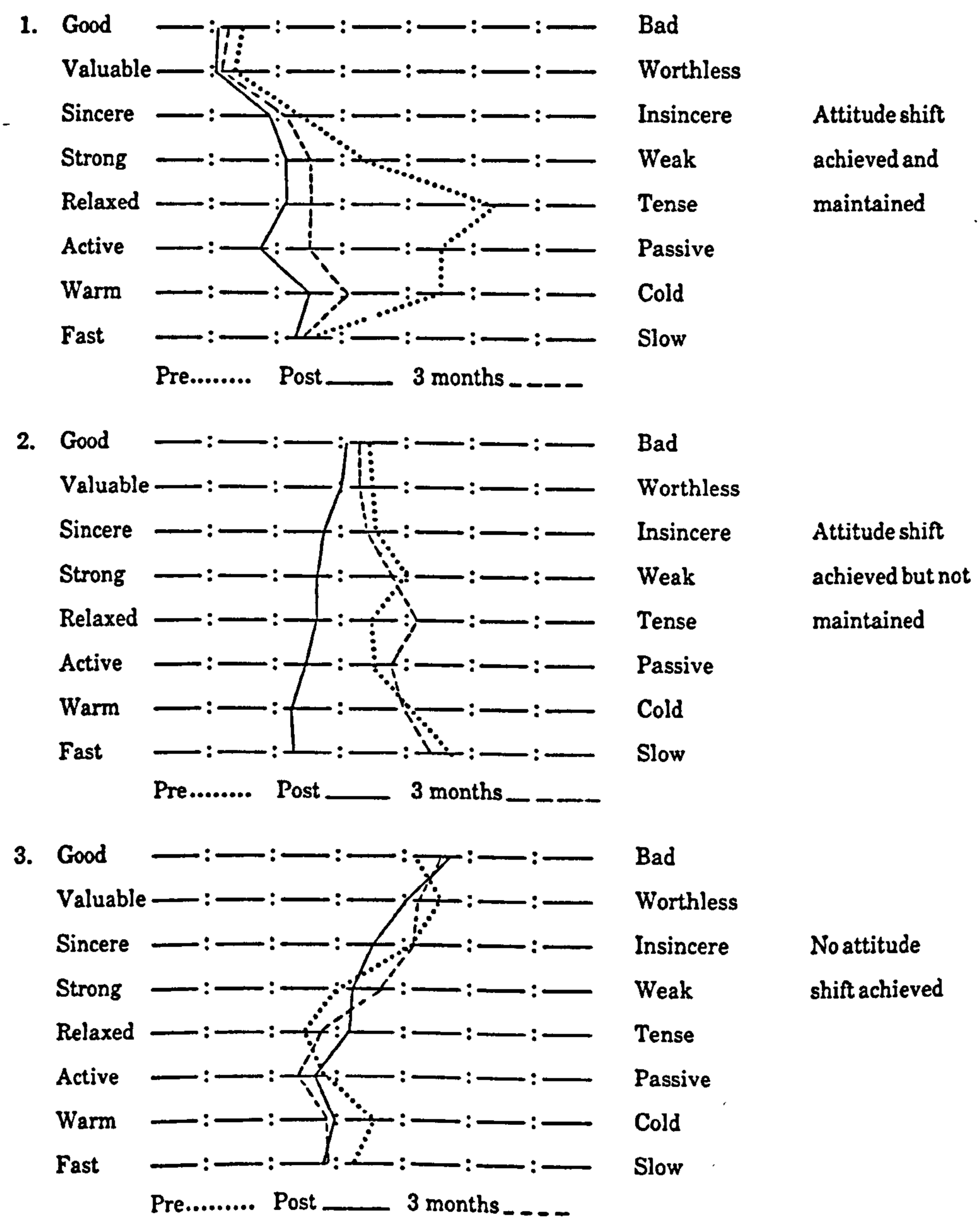
overcome. Their age and experience points towards a perceived high level of competence and knowledge. They often wish to obtain skills and knowledge for immediate use to overcome current-life situations, i.e. seeking solutions to problems, rather than setting out on a planned, long-term programme of education and training with a resource analysis (staff development audit) as the starting point.

The areas of training need may be identified by looking at the knowledge, skills and attitude levels of the individual and comparing them to the levels required by the organisation/job as shown in Figure 3. This has been reviewed and studied in Youngman (1978) and Bramley (1986). Knowledge levels may be assessed by tests using open ended and multiple choice questions, skills levels may be assessed using job performance criteria and skills analysis, and attitudes by using the Semantic Differential technique (an example is shown in Figure 2). This technique is used to establish positions on a series of bi-polar scales. Each participant is asked to rate selected concepts covered by the training using these scales. A test before the course starts is compared to the same test carried out immediately after the course and three months later. The example in Figure 2 shows that for the concepts measured there was a strong attitude shift that was achieved and maintained in the first case, not maintained in the second case and no change at all recorded in the third case.

The information can be used to assess individual change or averaged to assess group change. The technique is neutral with respect to the direction of change. The trainers should be

able to state the desirability of a directional change and its direction.

Figure 2. The Semantic Differential Technique used to Establish Attitude Shifts



Source: Bramley (1986)

The work by Bramley (1986), Birnbauer (1987), Kirkpatrick (1976) and others has lead to the development of a knowledge, skills and attitude personnel audit, by Davies (1989).This can be used by Training Officers to monitor staff development programmes and for use as a recruitment aid. The profile analysis shown in Figure 3 demonstrates a valuable use of this management tool.

The Training Officer would list the areas of knowledge, skills complement and attitudes required by the Company for each employee in the first column as items "a" to "f". These requirements are rated by the Company on a scale from "little need" to "essential", i.e. numerical ratings of "1" to "12" respectively. The individual employee can then be rated by the Officer using personnel records and results from training courses. By joining up the ratings, a profile of the employee's abilities compared to the Company needs can be drawn.

Two main item areas for staff development are graphically demonstrated in Figure 3.

A. Where the company requires high levels of ability and the employee has little or

B. Where the company requires a low level and the individual has a high level of competence.

Two areas of frustration may develop. "A" can be overcome by training and "B" by the redesignation of job description. The training must add to the existing level of skills, knowledge and attitudes. Skills and knowledge shortfall can readily be measured using questionnaires and audits and remedied by relevant instruction. Attitudes, included as a determiner of behaviour (and performance), can be shaped by new experiences provided by activities in training programmes as envisaged by Morrison (1976) and Jinks (1979).

Figure 3. The Development of a Personnel Profile for use by Training Development Officers

Personnel

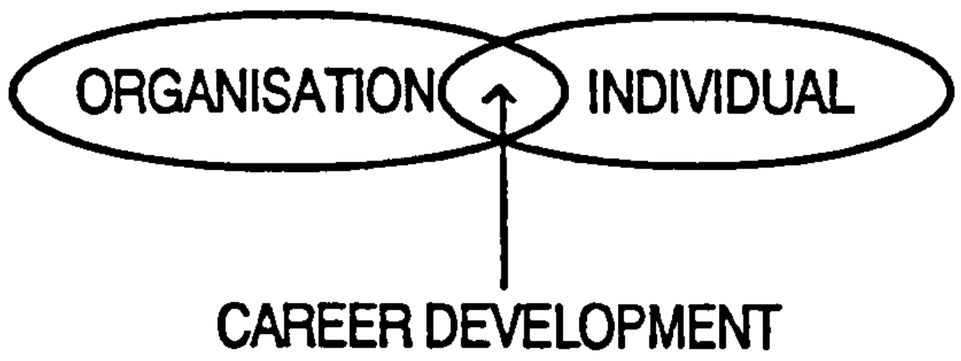
Profile Analysis

Enterprise:																							
Activity/Role/System:																							
REQUIREMENTS		**NEEDED BY COMPANY**												**AVAILABLE FROM INDIVIDUAL**									
(Knowledge) (Skill) (Attitude)		**Little**				**Average**						**Essen-tial**		**High**				**Average**					**Little**
		1	2	3	4	5	6	7	8	9	10	11	12	12	11	10	9	8	7	6	5	4	3	2	1
Areas of Knowledge	a				X															X					X
	b												X				A								X
	c						X																		
	d								X																
	e					B																			
	f											X													
Skills Complement	a											X													
	b										X														
	c											X													
	d								X																
	e							B																	
	f						X																		
Attitudes	a				X																				
	b						X																		
	c											X													
	d								X																
	e								X																
	f							B																	

Source: Davies (1989)

Nadler (1984) has shown, Figure 4, how the organisation and individual's spheres of requirements overlap successfully if a good career development system is part of the employment package.

Figure 4. The Need for Career Development



Source: Nadler (1984)

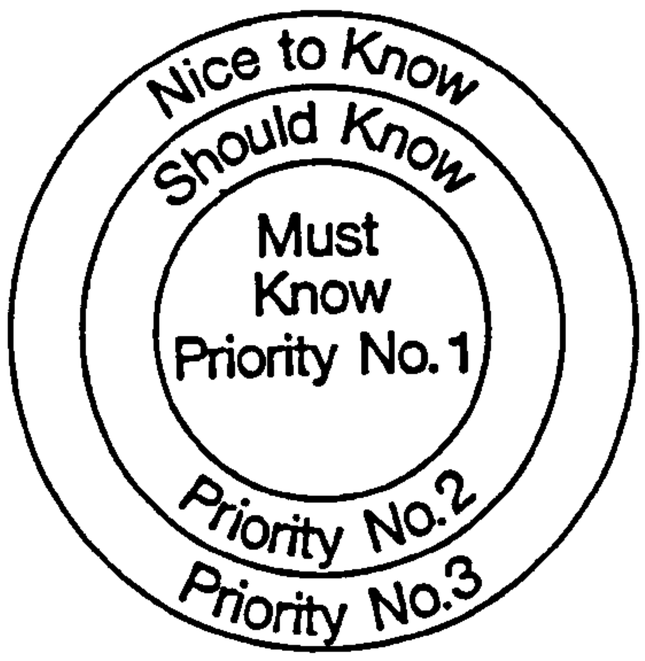
However, as Boydell (1979) points out, there are three levels of training need within the framework mentioned above:

1. Organisational - where in the organisation is training most needed?
2. Occupational - what is needed to carry out duties?
3. Individual - who needs training in what?

This measured training need should be met by a programme of staff development covering the areas required to develop the staff designated for training. The type of programme is discussed in Rae (1983) with self development, learning in groups and using case studies being very important.

All technical subjects have an essential core of knowledge or skill that trainees "must know". There are valuable and interesting parts which they "should know" and finally the trimmings that it would be "nice to know".

Figure 5. Priorities in a Training Programme

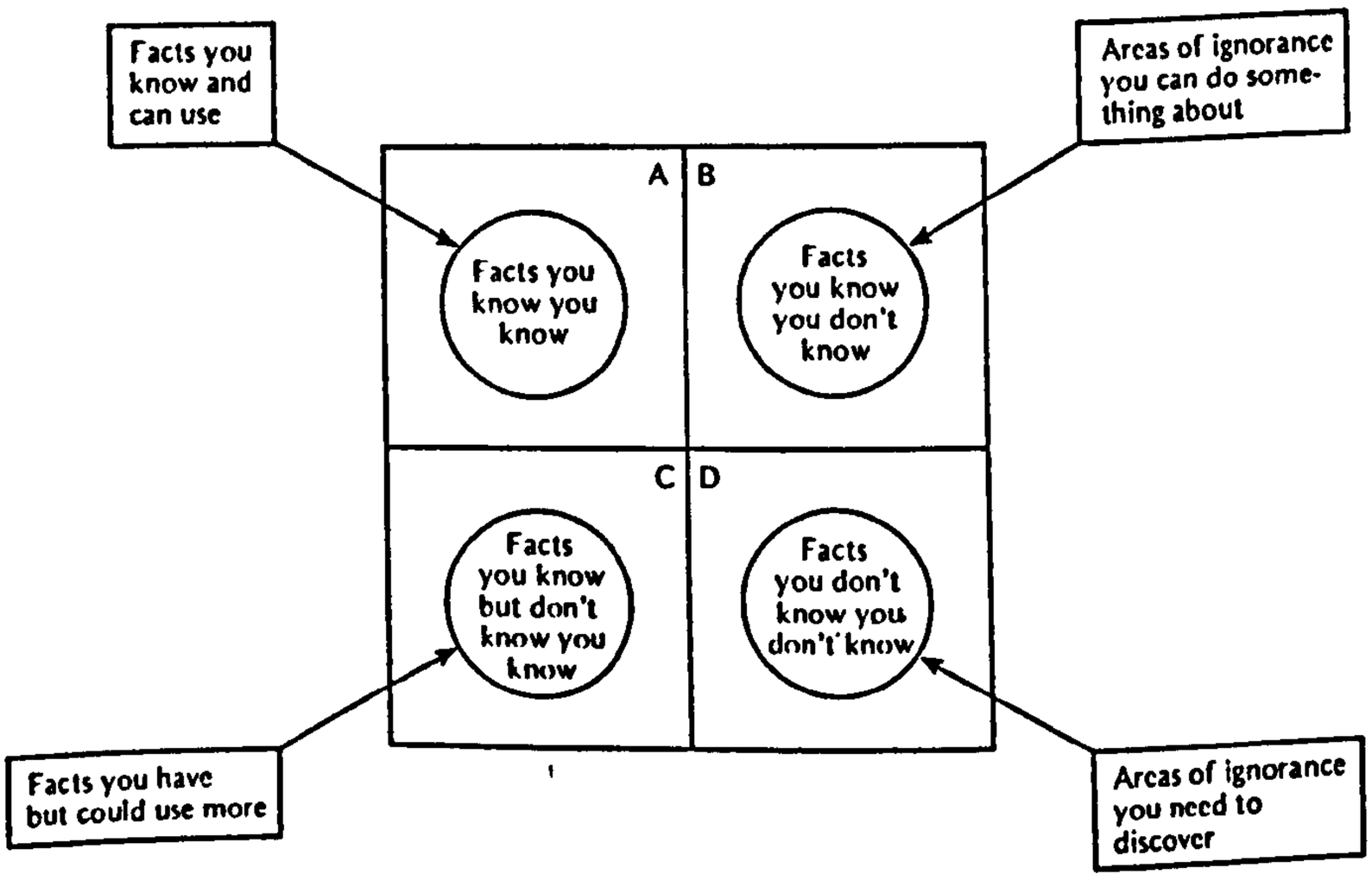


Source: C.M.P.I. Training Board (1985)

Mills (1977) discussed the movement of taught material within these three sections, Figure 5, to promote interest and motivation in the classroom sessions.

Pedlar et al (1978) discussed the importance of the intensity of factual information that a trainee manager may require for self-development, Figure 6. The requirement to prioritise is very important so that the facts you know are used regularly, and areas of ignorance are reduced, i.e. an emphasis upon achieving box A for this area of development.

Figure 6. Prioritising Factual Information



Source: Pedlar, Burgoyne and Boydell (1978)

There are a number of reviews concerning the methods of detecting training needs in Bramley (1986), Steward (1987), Knowles (1984 a and b) and RTITB (1979) and Davies (1989). The use of a knowledge, skills and attitudes model to assess the needs of the organisation/job compared to the needs and abilities/knowledge of the employees is endorsed by Davies (1989). This is also a follow-on technique to be used after training and requires a high level of management input.

2.3. How Can Training Be Achieved For Experienced Agriculturalists?

Davies (1967) recognises certain principles of learning upon which most educationalists would agree:

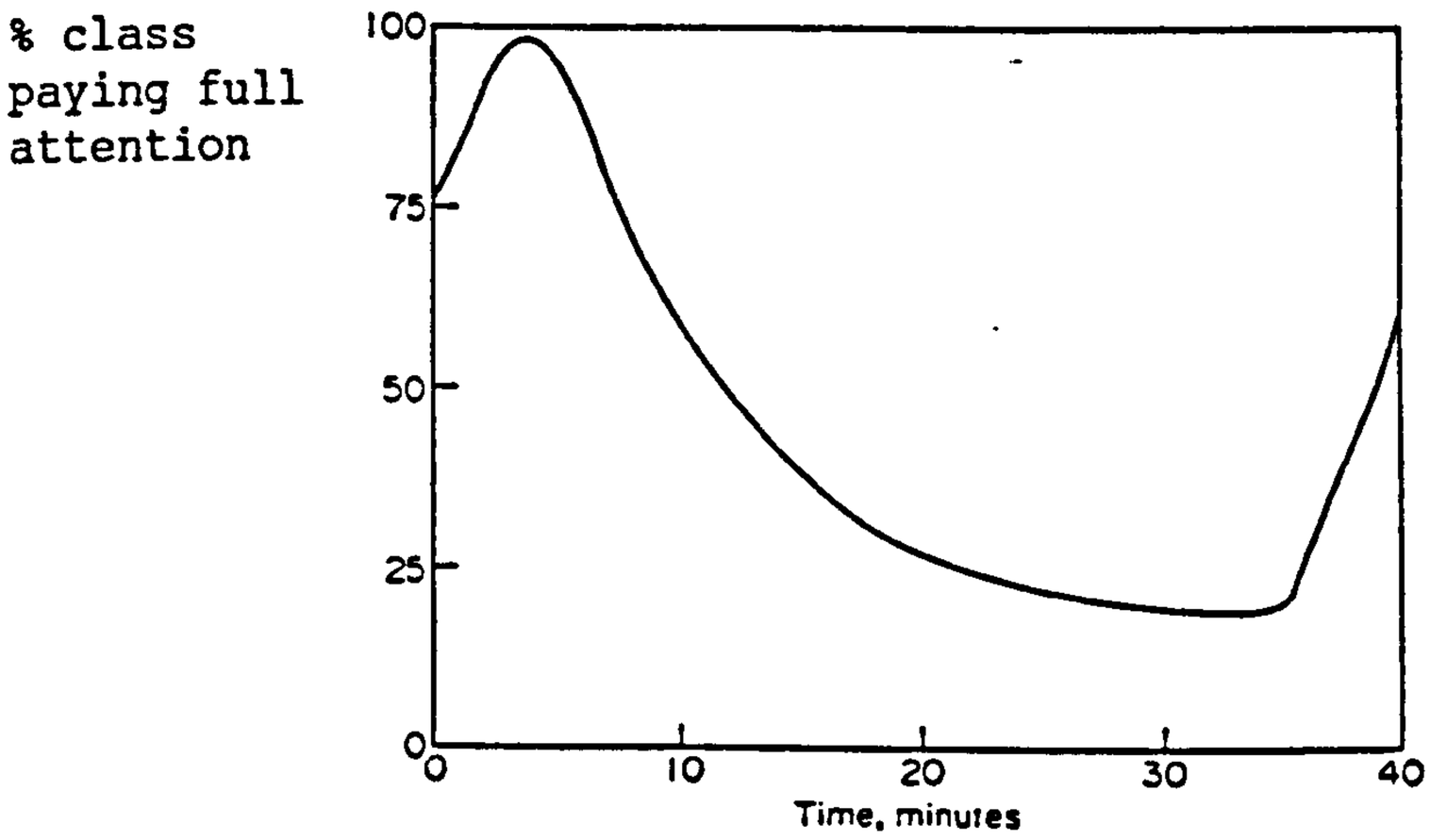
- whatever students learn they must learn for themselves, no-one can learn for them
- each student learns at their own rate, and for each age group the variations in learning rates are considerable
- a student learns more when each step is immediately strengthened
- full mastery of each step makes total learning more meaningful
- when given responsibility for their own learning, students are more highly motivated, learn and retain more.

The findings of Mills (1977), and McCormich (1975 and 1976) show that training for specific skills rather than reliance upon on-the-job learning halved the time required to achieve a target level of performance. However, the training does rely upon the learning styles employed by the trainers. Kolb (1984) and subsequently Honey and Mumford (1986) have categorised learning into four styles related to processes.

1. Activists - get involved in new experiences
2. Reflectors - postpone involvement until weighed up everything
3. Theorists - prefer detachment and objective judgement
4. Pragmatists - keen to try out ideas - practical people.

Agriculturalists would tend to be pragmatists and so a teaching style using a practical learning style/skill should maximise the success rate of training. The trainer must also bear in mind the class attention span, Figure 7.

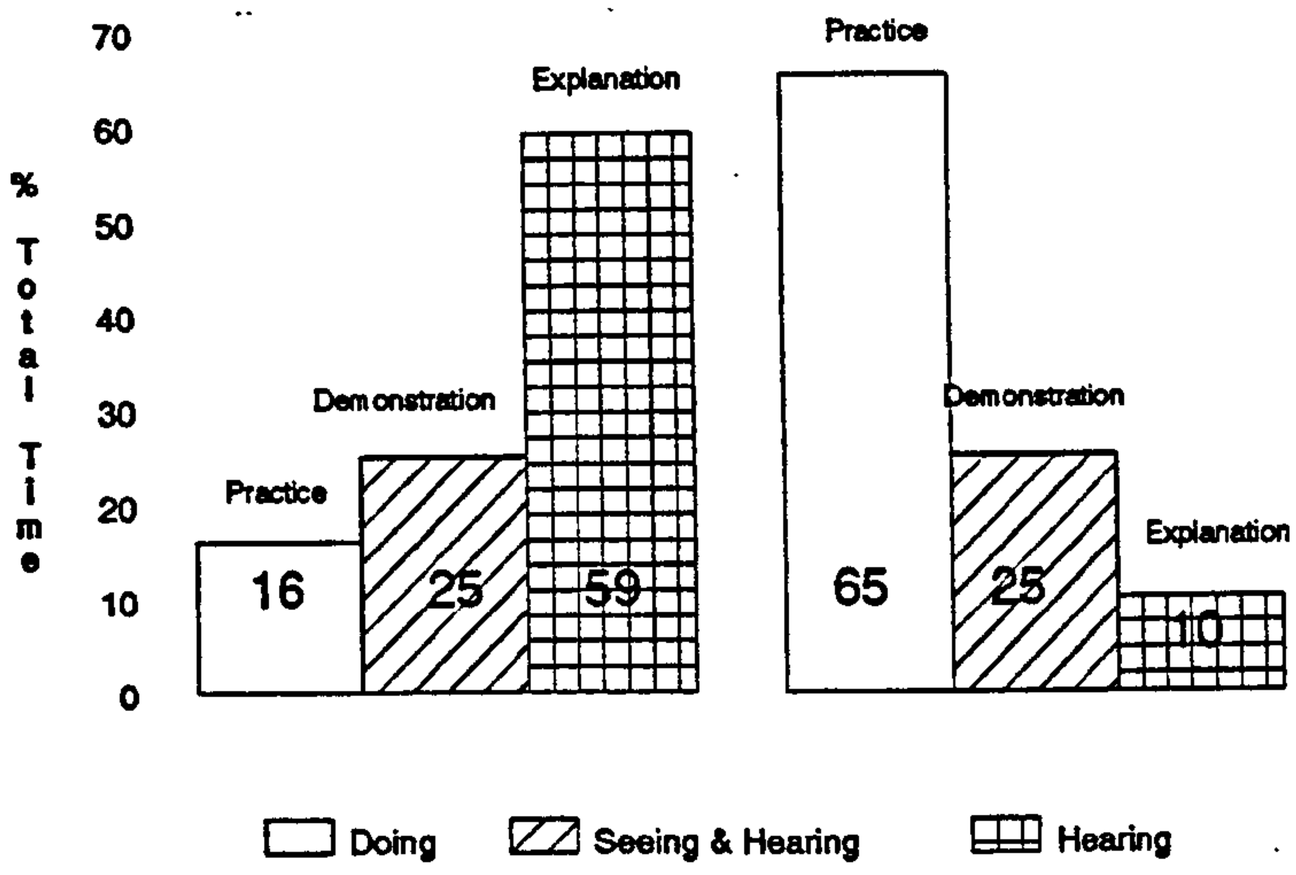
Figure 7 Class Attention: fluctuation during lectures



Source: Mills (1977)

In the teaching situation, the "must know" element, Figure 5, should be taught in the first section of the session or at the end. Questions should be asked at regular intervals throughout the period. With skills teaching in particular, the time allotted to "learning by doing", i.e. practice, should be high, rather than long periods of talking and writing notes, i.e. explanation. This is demonstrated by the work of Mills (1977) and summarised in Figure 8. A high level of "practice" may be a good use of time and a high explanation level may be poor practice in the agricultural situation.

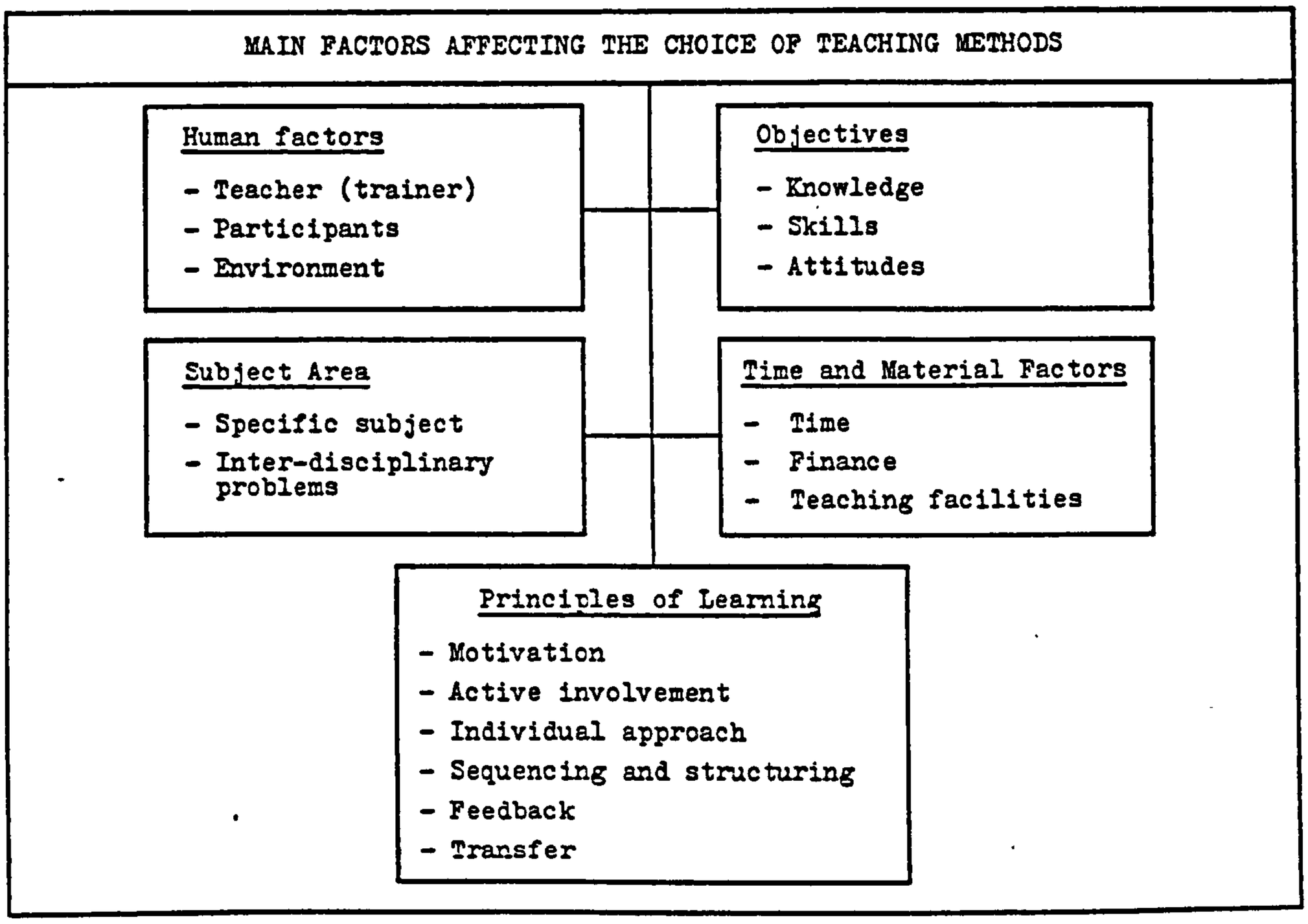
Figure 8. Teaching Patterns Showing Poor Use and Good Use of Allotted Time



Source: Mills (1977)

The following points are all very important when looking a the question of "how can training be achieved?" The level of ability and knowledge should be known. The trainer should teach the "must know" areas and then the "should know" must be prioritised, as shown in Figures 5 and 6. The speed of delivery and use of prepared work depends on the trainees. Whether the minds are receptive to the learning process may depend upon previous work and group motivation. Belbin and Belbin (1972) and Brookfield (1986) review fully the problems in adult training and retraining. There is a great reluctance to retrain along with high levels of anxiety concerning speed of learning compared to others in the group. There are often problems with illiteracy, self-confidence and training delivery, Kiewra (1958). The trainer must pick the correct combination to suit the majority of the group, Figure 9.

Figure 9. An Introductory course in Teaching and Teaching Methods for Management Development - International Labour Office, Geneva 1985



Source: Kubr (1985)

2.4. When and Where Can Training Take Place For Experienced Agriculturalists?

The timing and location of a course for experienced adult agriculturalists are very important as with any other training experience. Should the training be internal or external, on-the-job or off-the-job, during the working week (fitted in where possible) or as a discrete package to concentrate the mind? Young (1986) points out that there are no hard and fast rules determining the when and where of training, Figure 10.

Figure 10. Application of Some Principles of Learning in Teaching Methods

Principle / Method	Training on the job	Lecture	Group Discussion	Case Study	Business Game	Role Playing	Application Project	Reading Assignment
Motivation	■	■	■	■	■	■	■	□
Active involvement	■	□	■	■	■	■	■	■
Individual approach	■	□	■	■	■	■	■	■
Sequencing and structuring	■	■	□	■	■	□	■	■
Feedback	■	□	■	■	■	■	■	□
Transfer	■	□	□	■	■	■	■	□

Rating: ■ Good ■ Average □ Weak

Source: Kubr (1985)

Internal training (often on-the-job) has the advantage that the participants have up-to-date knowledge and an understanding of the "real" business problem. External training will introduce the elements of objectivity, a fresh, outside view of the problems, a proven training product and credibility with the trainees on experience, knowledge and research. The latter is often a major criticism of internal training. Robinson (1985) lists the many advantages and disadvantages of the location of training.

Figure 11. The Location of Training

ON THE JOB	OFF THE JOB
Advantages	**Advantages**
1. No transferability of training	1. Away from home and work pressures
2. No special facilities required	2. More time available
3. No extra staff involved	3. Relaxed atmosphere conducive to learning
4. Real life situation	4. Trainees specific difficulties easier to explore
5. Controlled learning	5. Easier to get full attention of trainees
6. No extra cost	6. Improves morale and motivation for self development
7. Productive in terms of Department's work	
8. Trainee can establish work relationships from the start	
Disadvantages	**Disadvantages**
1. Cost lost in Department budget	1. Cost of external facilities
2. Risk to machines and increase in scrap materials	2. Artificial sheltered environment
3. Part-time instructor lacking skill in training	3. Difficult to simulate work problem
4. Lack of time due to production pressure	4. Resistance of trainees to go away from home
5. Psychological pressure due to exposure to experienced staff	5. Difficult to transfer learning
6. Difficult to accommodate trainee idiosyncrasies	6. More time consuming
	7. Travel costs and inconvenience

Source: Robinson (1985)

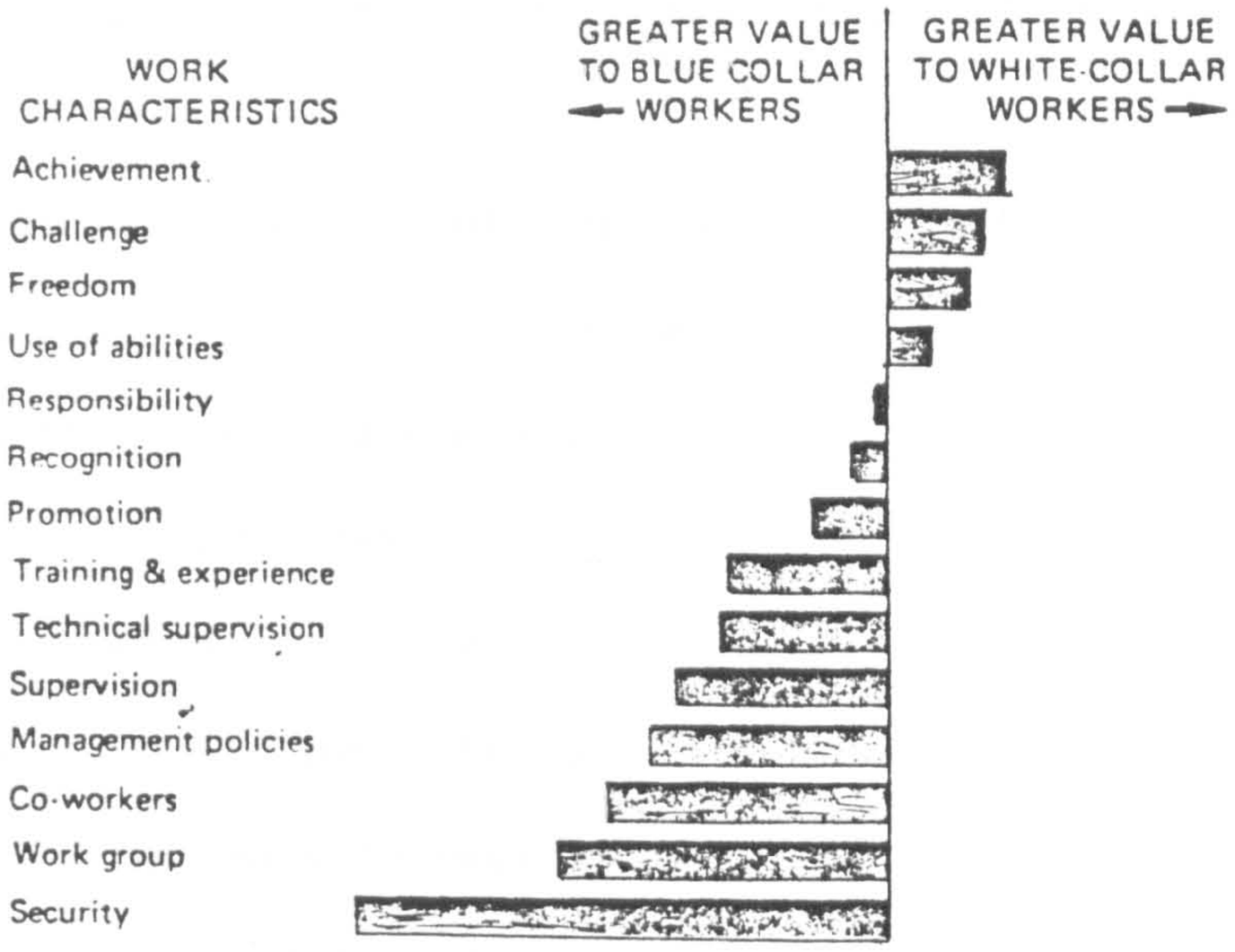
The timing of training is of equal importance as shown in some of the disadvantages for on-the-job training. The time pressures of production would tend to impinge upon the training

activity. The arable sector would tend to use the slack time during winter but it is often the busy times that accentuate the training need and so reduce the problems of training transferability. The intensive livestock sector, e.g. pigs, is never slack and so the training must be carefully programmed. As Belbin and Belbin (1972) point out on many occasions, creating the right atmosphere for adult training depends on the very material and content of training along with the timing and venue for that training experience. The adult's susceptibility to annoyance, when a venture is interrupted, is based on a simple psychological fact - interruption causes forgetting, especially when learning is not consolidated. Smith (1988) reviews the critical characteristics of adult learners and their needs. Retraining within the firm seems the one condition which compels or encourages companies to tailor their training plans to meet the collective problems of individuals with similar backgrounds. A skilful instructor must adapt the location, timing and training material to match his/her target audience as reviewed in Kenney, Donnelly and Reid (1979). One American study, by Drawbaugh and Hull (1971), referred to the problems of enrolling rural workers for further education and training. Success was achieved when a training programme in agricultural mechanics was taken out into the fields, the only environmental context in which the workers were fully at ease.

The need for training and the context and environment in which this training should be delivered have been explored.

An adapted Friedlander scale shows the importance of training and experience to blue-collar workers, i.e. agricultural employees, Figure 12.

Figure 12. Differences in Mean Response of Blue-collar and of White-collar Workers to Questions regarding the Importance of 14 Job Characteristics



Source: Friedlander (1965)

This leads on to the hypothesis that the following points will be considered in this thesis.

2.5. Development Of The Hypothesis

An evaluation of training for experienced agriculturalists was proposed and before the study could commence, an exhaustive review was carried out of the criteria on which to base this research and then the methods of data collection.

It was important at the outset to make a clear distinction between the criteria that are affected by the stockpeople/workers and those that involve management decisions, e.g. mortality of piglets (stockperson's control) and cost of feed for piglets (management control). Otherwise the data collected may be irrelevant when used to evaluate the effectiveness of training. A balance of objective and subjective data was proposed.

2.5.1. Objective Criteria

Various objective criteria were listed and examined for validity, reliability and the ability to collect data.

Criteria such as:

(a) **Increased Physical Output from the unit due to:**

- increased piglets reared per sow per year
- increased first service numbers
- improved farrowing index
- decreased disease incidence
- decreased mortality percentages.

(b) **Change in System with regard to:**

- use of condition scoring for sows and finished pigs
- more objective gilt selection programme
- introduction of outdoor pig units
- loose housing management for sows.

(c) **Introduction of Recording of Unit Physical Performance**

- used for comparative purpose
- used for culling and veterinary preventative medication.

2.5.2. Subjective Criteria

Various subjective criteria were also tested in the same way.

(a) **Increase in Depth of Knowledge/Skill**

- heightened the awareness of problems both potential and actual
- gave the possible solutions to problems
- enhanced skill levels and abilities

(b) **Attitudinal Changes**

i.e. - increased commitment and motivation, duty to do best by the herd (the empathetic area of stockperson interrelationship with stock)

- increased job satisfaction - interest
  - knowledge

The whole concept of training experienced agriculturalists was based on the need for updating staff in the areas of knowledge, skills and attitude relevant to their work situation. A staff development audit to identify the individual's weak areas should be carried out by the unit managers or farmers. The courses should be designed to match the experience of the attenders and the style of presentation, e.g. lectures, discussions or practical sessions, would be suitable to disseminate the information. A report-back session to the unit managers should feed back any satisfaction/dissatisfaction with the training for improvements to be put into place. The effectiveness of the training should be measured in the increased knowledge, skills development and attitudinal development giving an overall positive change in efficiency measured as output, system alterations and use of records, Patton (1980).

2.6. The Hypothesis

The hypothesis pursued in this study assumed that there are measurable increases in the level of knowledge, skills and attitudinal improvements for experienced agriculturalists who attend training courses in their employment discipline. Secondly, that their individuality contributes to the range of responses to training and the potential for the use of these quantified increases in their enterprises.

Therefore there are five main objectives in this study of training for pigpeople:

(a) to establish a mechanism for measuring the increases in the level of knowledge, skills and attitudes,

(b) to establish the effectiveness and relevance of the chosen mechanism for measurement,

(c) to identify the importance of individuality when considering who to send for training,

(d) to test for any possible correlation between the subjective criteria used in (a) above and the physical unit performance "objective criteria",

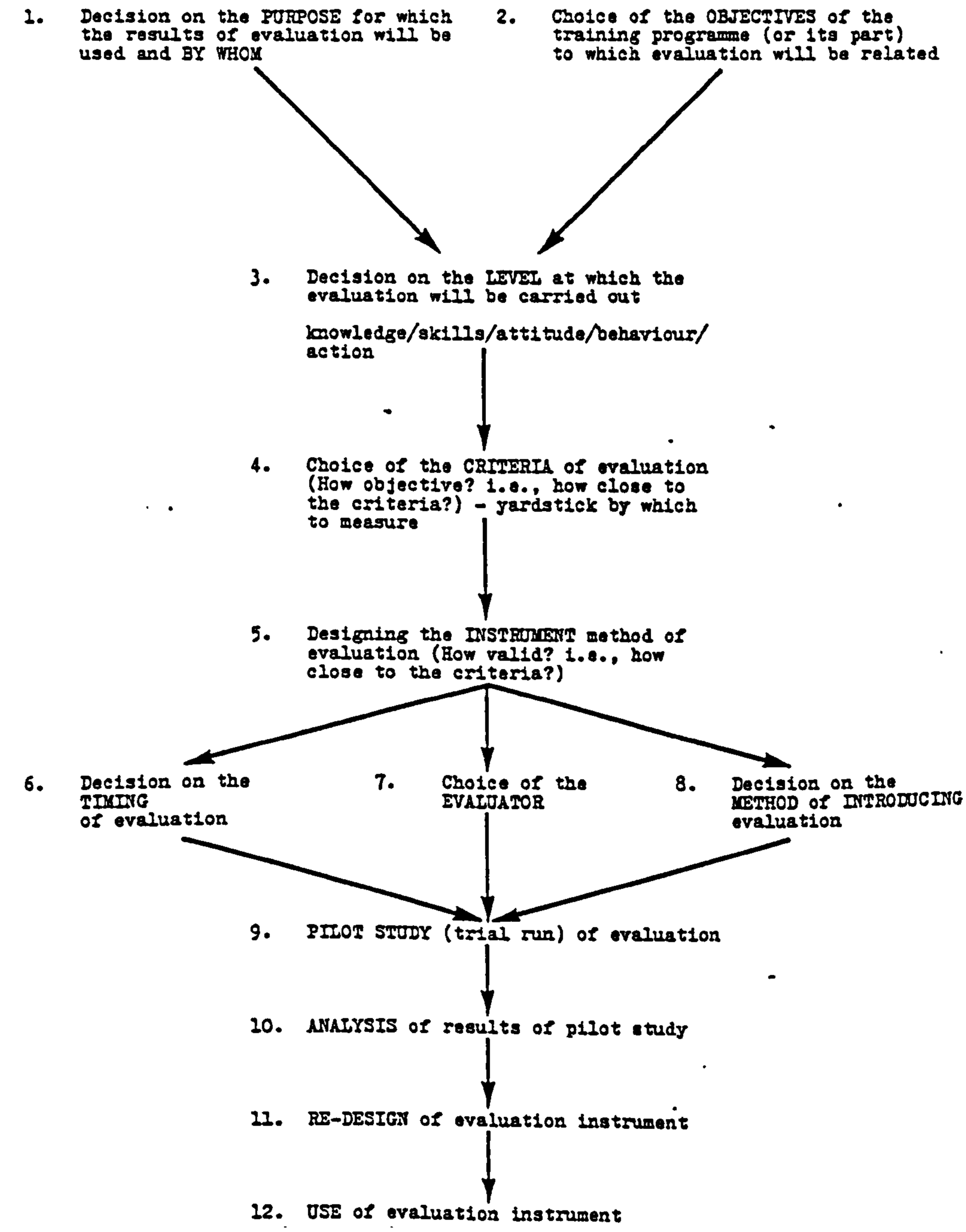
(e) to draw conclusions about the techniques employed and their use in evaluating the effectiveness of a course of training for experienced agriculturalists.

With these objectives in mind, the various techniques available for research in the area of evaluating the training of "skilled" agriculturalists were assessed. The hypothesis suggests that there are techniques available to measure the increased knowledge, skills and confidence gained by following courses of training. This should lead to improved "stockpersonship", at both the operative and empathetic level, resulting in possible positive effects on unit physical performance. This had a direct bearing on the types of technique reviewed and eventually employed, Figure 13. Warr (1970) has shown in a flow diagram the various stages in evolving an instrument for evaluating the effectiveness of training.

This had a direct bearing on the types of technique reviewed and eventually employed, Figure 13.

The purpose for which the results of evaluation will be used and by whom have been discussed earlier in this chapter, along with the level of evaluation. This will pursue the knowledge, skills and attitudes assessment of individuals attending

Figure 13. Stages In Evolving An Evaluation Instrument



Source: Warr (1970)

specific training courses. Decisions upon the timing, the evaluator and the method of introducing evaluation will be discussed as the methodology and choice of data collection techniques are reviewed in Chapter 3. A pilot study will be a necessary element in the process so that any re-designing of the evaluation instrument can be introduced and be effective in the second phase of data collection. This will be the proposed sequence of events that is fully explained in the following chapters.

This is not a long review of the philosophy of training although some of the issues are discussed in this chapter. The researcher is looking at the evaluation of training and hence the methodologies will be reviewed to establish an appropriate design for data collection and analysis.

CHAPTER 3

TECHNIQUES AVAILABLE FOR RESEARCH IN THE AREA OF EVALUATING TRAINING FOR EXPERIENCED AGRICULTURALISTS

There are many techniques available for evaluating training courses, some of which would be totally inappropriate for the study of experienced agriculturalists participating in these sessions. The stages in evolving an evaluation instrument are shown in Figure 13.

The Agricultural Training Board include a course evaluation in their structured sessions for Enterprise Training Groups and tutors would be expected to engage the trainees in completion of the plenary session checklist or questionnaire.

3.1. Quasi-Experimental Designs

A review of the different techniques was carried out by Girdler (1984). There are ten main quasi-experimental designs, six of which were considered to be available to the evaluator of this training programme. The first three are generally uninterpretable and the rest are interpretable. These have been discussed in Campbell (1963) and summarised by Cook (1976) and they are now discussed in the light of the training of experienced agriculturalists, e.g. pigpeople.

The key to the models used is: X stands for the treatment; O stands for the observation; subscripts 1 through n refer to the sequential order of implementing treatments (X_1 .....X_n) or of recording observations (O_1 ....O_n); and a dashed line between experimental groups indicates that the groups were not randomly formed.

3.1.1. **The Case Study** ($X\ O_1$) This involves the treatment or training input and one observation which is the testing "after"

the training course has taken place.

The evaluator makes a study of each member of the population involved in the training and uses the data collected to test the effectiveness of the training, using certain criteria. This is a suitable technique if the population is low in size and the amount of time available for the two people involved to discuss the training is long.

The advantages of this system are:

(a) An in-depth study can be made of the respondent and the way in which the treatment has affected the respondent.

(b) The reliability is high but validity suffers from a lack of randomisation.

The disadvantages of this system are:

(a) The cost of the programme, assuming that the researcher must spend some hours per person collecting the data, becomes prohibitive.

(b) Statistical conclusion validity is a problem with the low numbers of respondents involved, Donald (1960). The results are very difficult to interpret as the treatment may not have given the improvement.

(c) Familiarity is often a problem with this interview type.

Pigpeople generally do not have a lot of time at work to spend on answering questions as part of an in-depth case study. The physical data for the herd may be readily obtained from the farm office, or by using a mailed questionnaire. The interview situation is often used in preference to the mailed questionnaire for collecting self-rating information. However, the case study approach may require frequent interviews and

cause bias in the reply to any self-rating and course rating questions as the familiarity factor between the interviewer and interviewee increases.

3.1.2. Post-test Only Design with Non-Equivalent Groups

_____ The symbols for the trainees are above the line and

X O_1 represent the treatment as X and the Post-test as O_1.

------- The non-equivalent control group below the line are

O_1 not trained but are given the same Post-test as the

_____ trainees.

This design has been established to eliminate the pre-conditioning of the group. A control group is usually involved which is not equivalent and has not attended the training programme.

The advantages are:

(a) No conditioning can take place.

(b) A non-equivalent group is tested along with the attenders - a form of control group.

The disadvantages are:

(a) There is no way to measure the change over the training period for the attenders (pre and post).

(b) The change measured may be the difference between the groups only and not due to the training.

The researcher decided that this design did not allow for the comparison of the "before" and "after" for the trainees unless they were requested to assess the before situation, after the course (see later on in this section). There is no conditioning which is considered a strong advantage in favour of this design, Fast (1974).

3.1.3. Pretest, Post-test Design

O_1 X O_2

O_2

This design is represented by the symbols O_1 as the Pretest, X as the treatment and O_2 as the Post-test response to the treatment. The design will Pretest the course attenders and either Post-test the same group after the training or post test an equivalent group of people who have been chosen randomly from the total population of attenders, interchangeable groups, Linn (1977).

The advantages of this design are:

(a) The researcher can assess the position of the respondents who were at different positions before the experiment.

(b) The sensitivity may be increased if the respondent is tested on the initial position of the dependent variable before exposure.

(c) In the event of the researcher not being able to assign subjects randomly he may wish to check their initial comparability. Evidence from the "before" measure helps to increase confidence that the difference on the "after" measure is due to the effects of the experimental variable, Boruch (1978).

(d) The advantage of being able to interchange the groups thus lowering the conditioning effect.

The disadvantages are also numerous:

(a) The "before" may condition the "after" response, Bunker (1977).

(b) One must assume that no other influences come to bear on the subject to change the after response.

(c) The assumption that each subject acts as his own control.

(d) Validity and time lapse between measurements are problems.

This design may be suitable for the evaluation of the training of pigpeople. However, the disadvantages are considerable. The conditioning may have a large effect upon those pigpeople who do not participate in this type of training evaluation on a regular basis especially when answering any self-rating sections. They may reply by giving the same comments or scores and not revaluing their "after" training position.

The training group may be too small to give interchangeable groups. However, the researcher is able to test the change over the training period which is an advantage over the previous designs which are analysed by Huck (1975)

3.1.4. Untreated Control Group Design with Pre and Post-tests

The symbols represent the Pretest as O_1 and the Post-test as O_2. The trainees, above the line, receive the training as shown by X and the control does not. Both groups are tested at the same time using the same devices, i.e. questionnaires or interviews.

_____	The design uses Pretest data to correlate
O_1 X O_2	with Post-test scores for the attenders. The
----------	control group is used in an attempt to take
O_1 O_2	account of the effects of both the initial
_____	measurement and external factors which may

influence the attenders and control group alike, Bracht and Glass (1968).

The advantages of this design are:

(a) The control group should counter the effect of conditioning and external factors.

(b) The control group will give some idea of the effect of the treatment by difference between the answer scores.

(c) Good control of internal validity.

(d) Matching the control with the attenders will control selection - maturation.

Disadvantages:

(a) The questionnaire design is a problem especially if attitude measurement is required. This is made worse by using two or even three control groups, Soloman (1949) and Kornhauser and Sheatsley (1959).

(b) Variation in the stability coefficient and the equivalence coefficient occur when a time lapse is introduced for the post test, Heise (1969).

(c) It is difficult to find an equivalent or non-equivalent control group.

(d) Other validity measures pose problems with all the different designs using Pretest and post test, Thorndike (1942).

This design takes account of the effects of the initial measurement and external factors by using a control group as a standard. It will pose some problems to find an equivalent control group for the comparison. The design will still enable the researcher to assess the changes within the trainees as well as between the control and trainees. This seems to be a suitable design to evaluate the training of pigpeople and it can be carried out by using techniques from a distance and providing data which should be easy to analyse. However, the researcher considered the format of the subject day training where trainees attended one day only in many cases and not a series of days. Pretest and Post-test would mean a test in the

morning and a test after the course in the evening. This did not seem to be very desirable.

3.1.5. Selection Cohort Design - Post-test only.

This design is similar to 3.1.2., Post-test only with non-equivalent groups. The trainees, above the line, and equivalent control group, below the line, are given the same postest shown as O_1.

X O_1 The basis of the design is to seek out groups who

------ differ in as few ways as possible except for

O_1 receiving the treatment. This design is weakened by no Pretest, which, if included, would reduce the problems of history and selection in particular. It is a useful design when it is feared that age or experience can alternatively account for results in a Pretest-Post-test design.

3.1.6. Pre-then-now Design

O_1 X O_2 This design is symbolised by X as the training and O_2

O_3 as the Post-test evaluation or "Now" situation. O_3

------- represents the test used to assess the trainee levels

O_2 "before" the training but administered "after" it has

O_3 occurred, i.e. Then. The trainees O_3 above the line,

_____ and control group, below the line are given the same

tests at the same time.

The design should take account of the "response-shift bias" that can occur if the trainees are unaware of their true level of competence in the subject area of the training course before it commences. The traditional Pretest and Then now-test self reports handed out "before" and "after" the course respectively, use rating scales (Likert-type) and suffer from the problems noted and referred to in the work of Girdler

(1984) and Campbell (1963); pre-conditioning, maturation and validity.

The Pre-then-now self reports used by Ralph (1975) and later by Howard (1980), Howard, Ralph, Gulanick, Maxwell, Nance and Gerber (1979) and Rae (1984, 1985) showed statistically significant changes in response, bearing in mind the response-shift bias that occurs as the trainees re-evaluate their levels "before" the course in the light of their new reference frame. Mezoff (1981) points out that a comparison between Pretest, levels and the Then levels, i.e. an assessment of the level "before" the course that was made after the training had taken place, can be made as well as the Pre and Then-now comparisons. "Now" is the trainee's assessment Post the training.This was not possible for the traditional Pretest, Post-test design due to the change in reference frame for the trainee in a given knowledge, skill or attitudinal area. The original questionnaires or measurements can be made but the test "after" the course requires the trainees to assess their level "before" the course after it has been completed. The trainees perceive what is meant by the scales used and this changes as they shift their level of understanding or depth of knowledge. It is like the overlaying of a stable continuum on a varying continuum. The Pre-then-now must be administered soon after the course so that any decay is reduced to a minimum. An assessment made Now, "after" the course, of the level before and after the training is an approach that reflects the actual before and after levels and depends upon the ability to remember "before" and willingness to report these levels. This is often referred to as the Then-now approach, Mezoff (1981). It does not rule out a group response but does control within group shifts. The

perception of a positive change can lead to a therapeutic impact upon the trainee. The technique tries to match objective and subjective realities with a high degree of success, and the main problem is inaccurate memory.

The design using the "after" only test but requiring a "before" measurement at the same time seems to be the most appropriate technique to use in this study due to the nature of the training (single subject days) and the time factor (interviews too lengthy and so questionnaires were deemed to be more acceptable - post training).

The Pre-then-now assessments will test the perceived changes over the training period (day) and the control group should reduce the effect of external factors and provide a comparative group to test pre-conditioning (some pre test measurements were made). However, quasi experimental designs have limited usefulness in field research into the evaluation of training effectiveness, so true experiments must be set up in field settings. These are reviewed in Miller (1983).

A Glossary of terms has been prepared and summarises the main terms used throughout the text.

GLOSSARY OF TERMS

Pretest - This is a questionnaire presented to a training course attender,"before" the course has started, for completion.

Post-test - This is the same questionnaire as used in the Pretest, given out and completed "after" the course has finished.

Pretest, Post-test	-	This is the experimental design used by a researcher to find out levels of ability, knowledge, skills, attitudes "before" (Pretest) and "after" Post -test) the course has been completed.
Pre-then-now	-	This is the experimental design that uses a questionnaire "before" the course has started. It also involves collecting data on the levels of attitudes "after" completing the course and at the same time re-assessing the level before the course has commenced.
Then-now	-	This is the completion of a post or now questionnaire "after" the course has been completed to assessed levels of ability, knowledge, skills and attitudes. At the same time the trainee is asked to assess their level "before" the course commenced, i.e. Then.

3.2. Field Experiments

3.2.1. The Research Interview

With the research interview, people of similar status may complete the interviewing so as to minimise status differentials, Stebbins (1972) and Nadler (1982). However, the inquiry stance dictates that there is a contrast between the interviewer and respondent, the former being more expert. Whichever stance is taken, the interviewer must maintain the motivation of the respondent. He must maintain trust, satisfy

altruism, emotional satisfaction and intellectual satisfaction and provide conditions for:

(a) Maximising privacy.

(b) Maintaining neutrality.

(c) Maintaining confidentiality.

(d) Listen well.

(e) Prevent cooling out, i.e. too much information given at the first session.

(f) Inform respondents about why and how they were chosen.

(g) Identify yourself.

There are six interview techniques used frequently for different situations and to achieve different objectives:

(a) **Focussed Interview** - A prior analysis of the situation and control are established before the interview. This technique satisfies the problems of range, specificity, depth and personal context.

(b) **Group Interview** - This is only very successful when the interviewer is well known and respected. The main disadvantage is the problem of people not revealing their true feelings with a group situation.

(c) **Tandem Interview** - This technique increases the rapport and accuracy of questioning and analysis. It is efficient and increases the range and depth of data with this high degree of accuracy.

(d) **Lengthy Interview** -This is usually 1-1½ hours in length and may need a follow-up interview.

(e) **Stress Interview** - The interviewee is always under pressure.

(f) **Automated Interview** - This is used for medical history and diagnosis purposes.

The advantages of the Interview are shown by Blum (1952), Oppenheim (1966) and Berdie & Anderson, (1974) and are:

(a) Assistance may be given in answering the questions and so a wider range of people may be tested (range of literacy and intelligence).

(b) It yields a better sample of the general population, i.e. may co-operate if they only have to talk.

(c) There is greater flexibility if the question is poorly understood.

(d) Better chance to appraise the validity of reports.

(e) It is a more appropriate technique for revealing information about complex emotion laden subjects, Selltiz, Jahoda, Deutsch, Cook (1959), Sewell (1949).

(f) It is more likely to create the atmosphere to allow the expression of feelings.

The disadvantages are:

(a) It is expensive and sometimes lengthy, Gross and Mason, (1953) and Collins (1970).

(b) The interviewer has to be highly skilled to obtain the information, Kahn and Cannell (1957), Hauck (1964), Guest (1947)

(c) Uniformity of the interviewer/s is very seldom achieved (different interpretation of the questions and bias occurs).

(d) Anonymity of the respondents cannot be achieved readily.

(e) Pressure upon the respondent to answer the questions.

(f) It relies heavily upon verbal report.

(g) Self-report at the interview involves self-diagnosis which poses many problems, Anon (1945).

The interview is a useful research method with many advantages but may not be used for this study due mainly to the cost and time factor involved. The pigpeople are busy people and this may add bias to their replies (e.g. they might say "YES" to shorten the interview time). This leads us on to look at the second technique used to collect data.

3.2.2. The Questionnaire

Another research technique is the Questionnaire, Nadler (1982). Berdie et al (1974) stated that "the questionnaire is a device for securing answers to questions by using a form which the respondent fills in himself".

There are three main questionnaire types related to the population being surveyed and the response rate to be achieved.

(a) **Mail Survey.** (Factual Data Replies)

(b) **Self-Administered Questionnaire.** This is usually presented to the respondents by the researcher and may increase the response rate due to opportunity for enquiries and explanations.

(c) **Group-Administered Questionnaire.** This is usually presented to the groups for completion all at once. Contamination due to copying and discussing can occur.

The advantages of the Questionnaire are set out by Berdie et al (1974):

(a) Low cost.

(b) Establishing contact is easy even with a large target population (mailed questionnaire).

(c) Easy to complete. (Only if there are clear instructions and unambiguous questions).

(d) Less bias if the wording is correct.

(e) Ease of tabulation.

(f) Uniform question presentation, Erdos (1970).

(g) Future study.

The disadvantages of the Questionnaire are:

(a) Response rate - the aim must be for a high first-time return level. This may be achieved with the self and group administered Questionnaires but rarely with the mailed type. The response rate will be high if the Questionnaire appeals to the eye and has a stamp addressed envelope inside. If, however, the questions are ambiguous, the instructions unclear, dull starter questions are asked at the beginning and it is very long, then the reply rate may be low because the respondents either cannot complete it or do not wish to complete it. A low reply rate, as many researchers have shown, Allutto, (1970) will mean that reminders may be necessary, i.e. prodding, and even a personal follow-up. Wallace (1954) studied the effects of those people who always respond, i.e. "habitual responders" and this could give a skewed distribution to the results obtained.

(b) Reliability and validity, Parry (1950).

(c) Question limitations - misinterpretation, Schwirian (1966).

(d) Prejudice against questionnaires, Gannon, Nothern and Carroll (1971).

(e) Impersonalisation.

(f) Which member of the household or organisation completes the questionnaire.

(g) Item independence.

The reception, completion and success of a questionnaire can depend on so many variables but if the researcher remembers that it is an imposition and designs it carefully, the result should be good. One of these areas is the design, sequence, content and type of question used in the evaluation.

3.2.3. Question Design

Problems may occur due to question design, reviewed by Noelle-Newmann (1970).

(a) A question may be worded well but may be difficult to assess statistically.

(b) A poorly designed question may give a narrow range of answers or be misunderstood or be too vague or ask for information unknown. It may be too technical or too abstract. Design improvements can be achieved using the pilot work.

(c) Use of the range from free answers to multiple choice questions.

(d) A repeated survey may end up with a standard format, Oppenheim, (1966).

3.2.4. Question Sequence

The sequencing of questions is very important so that the interview and questionnaire design are correct for the situation. The sequence that is often used, is to begin with factual questions and proceed on to attitudinal questions. These may take the form of closed and open-ended questions respectively. Many people have looked at question sequence and it still requires pilot work to establish the most suitable order, Erdos (1970) and Payne (1951).

3.2.5. Question Content

This falls into four main categories:

1. Content aimed at ascertaining facts. (Knowledge)

2. Content aimed at ascertaining beliefs about what the facts are. (Attitudes)

3. Content aimed mainly at ascertaining feelings, (Attitudes), Selltiz et al (1959).

4. Content aimed mainly at discovering standards of action. (Skills)

3.2.6 Question Type

(a) Fixed alternative (or closed) questions, e.g. YES/NO

These are popular for the following reasons but also have many drawbacks.

Advantages of using fixed alternative question are:

(i) Standardised

(ii) Simple to administer

(iii) Quick and relatively inexpensive to analyse with factual answers, Selltiz et al (1959).

These closed questions help to ensure factual answers are given in a frame of reference that is relevant to the purpose of the inquiry and in a form that is readily usable for analysis.

The disadvantages are:

(i) It may force a statement of opinion - no alternative is right, Litwak (1956).

(ii) It does not allow for different question interpretations, Dohrenwend (1965).

(iii) It can lead to bias as the respondent does not want to use "other" box, Crutchfield (1947).

(iv) It reduces spontaneity, Gross and Mason (1958).

(b) Opén-ended questions

These questions give the respondent the freedom of response and are useful when issues are more complex and relevant dimensions are unknown, Kahn et al (1957) and Birenbaum (1987).

Advantages of open-ended question

These questions allow:

(i) Free response.

(ii) Respondent can demonstrate any knowledge on the issue.

(iii) Respondents use their own frame of reference.

The disadvantages are:

(i) Very difficult to analyse.

(ii) The response area defines the depth of answers.

Closed questions are useful when factual information is required. They are also used as the basis for various techniques which rely upon the respondent making a check or some other indication of choice that enables the evaluator to calculate some kind of score. There are five main techniques in regular use:

(i) Checklist

(ii) Ranking

(iii) Inventories

(iv) Grids

(v) Ratings

These techniques have been reviewed in Girdler (1984) and Fichter (1988) and the most useful one for this type of work was thought to be the rating scales.

3.2.7. Rating Scales

These are very useful for placing individuals or objects being rated at some point along a continuum or in one of an ordered series of categories; a numerical value is affixed to the point or category. Scales differ in fineness of the distinction they permit, Guilford (1954).

There are three main types of rating scales:

(i) Graphic Rating Scales

(ii) Itemised Rating Scales

(iii) Comparative Rating Scales

The rating scale is defined in terms of a given population or social group.

They can be used in various ways:

(a) As objective assessments, e.g. rating the quality of furnishings in a house.

(b) As a subjective assessment to tell us something about the rater, his precepts and his attitudes and

(c) As self-ratings of personality traits or attitudes.

The latter would seem to be a useful technique for the pigperson to assess the value of a training course to himself. However, attitude ratings vary from day to day, especially if someone is asked to rate on a scale, certain attributes of a training course. Personal bias, generalised impressions, generosity factors and frames of reference are four reasons for variance between the assessors, Torgerson (1958).

Kerlinger's (1964) advice is especially pertinent: "If there is a better way of measuring attitudes, then use it. If there is not, then study the characterisation of good rating scales,

work with painstaking care and subject ratings to empirical test and adequate statistical analysis".

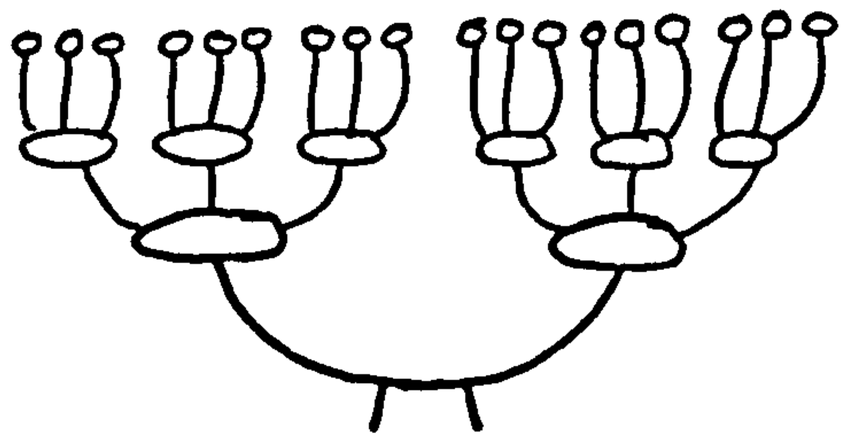
The questionnaire appears to be a suitable collection method. It is cheap and easy to complete and will collect data in the range, depth and accuracy that is proportional to the question content, design and type. It is a useful technique to use to collect knowledge levels and indications of perceived skills levels. Attitude levels are more difficult to assess and are considered in Section 3.3. Pilot work will be required to test the questionnaire before using it with a larger population.

There are some other methods for data collection that researchers have found useful, e.g. Participant observation. The expense in terms of money and time ruled out these alternatives.

3.3. Attitude Measurement

Any data associated with attitudes is difficult to collect and analyse. An attitude is a state of readiness; a tendency to act or read in a certain manner when confronted with certain stimuli, Keisler, Collins and Miller (1969). Attitudes are abstract but real to the individual. They can be positive or negative and so allow the researcher to give a rating or ranking to the respondents attitude statement, Thomas (1971). Care is needed when writing attitude statements and they demand pilot work, experience, intuition and a certain amount of flair. Attitudes reflect beliefs and are a strong guide to personality, Fig. 14.

Figure 14. From Beliefs to Attitudes



Beliefs

Attitudes

Values

Personality

Source: Oppenheim (1966)

There are five main Attitude Scaling Methods which rely upon the rating of attitude statements by the respondent. These are:

Social Distance Scales

Thurstone Scale

Likert Scales

Factorial Scales

Scalogram - Analysis - Guttman Scales, Oppenheim, (1966)

These were all reviewed in Girdler (1984) and Likert-type scales have been selected for this study

3.3.1. Likert Scales (Summated Scales)

Respondents were asked to place themselves on an attitude continuum for each statement. This was:

5	4	3	2	1
strongly agree -	agree -	Uncertain -	disagree -	strongly disagree

assessed for each statement. The total score can be tabulated and the score for each item is correlated with this total, Likert, (1932).

There are five principles that should be satisfied if the ranking or rating scales used are to be considered successful. The problem is that the final scale may include items that

correlate with the final score and even more highly with some subset of items within the scales. The principles are:

(1) Unidimensionality.

(2) Linearity and equal intervals.

(3) Reproducibility.

(4) Reliability.

(5) Validity.

The Likert Scales satisfy all five principles to the level required for this study. However the reproducibility is often lower than one would prefer, Oppenheim (1966) and Scott (1968).

The Rank-Difference correlation coefficient may be used to test the validation of such scales along with the product moment correlation coefficient. If less than one then the measure is influenced by some factor not affecting the other measure. If the coefficient is high then:

A may cause or influence B

B may cause or influence A

A & B may cause or influence another factor, Cronbach (1960), Scott (1968), Nunnally (1967) and McNemar (1971).

Cronbach α is used as a measure of the reliability and as a coefficient it tells what proportion of observed score variances is non-error variance. It depends on the spread of scores and the number of observations used to produce the respondents scores, Scott, (1968), Cronbach (1960) and Edwards (1963). The main problem with reliability is random error in social sciences. The test-retest reliability is a measure of the amount of random error in personal and situational factors during the passage of time, Lemon (1973), Guilford (1954).

Maslow (1976) points out a whole series of questions as the role of testing in training and development is considered by an employer.

- which of the employees are to be trained?
- where do these employees now stand in relation to the desired outcomes of training?
- how can it be determined whether the trainees are progressing?
- how can it be recognised when, and how fully, the trainees have met the training objectives?
- is the training, in fact, useful to employees careers and to company's business purposes?
- do the skills and/or knowledge attained at the end of training stand up well over time or are they merely transitory gains?

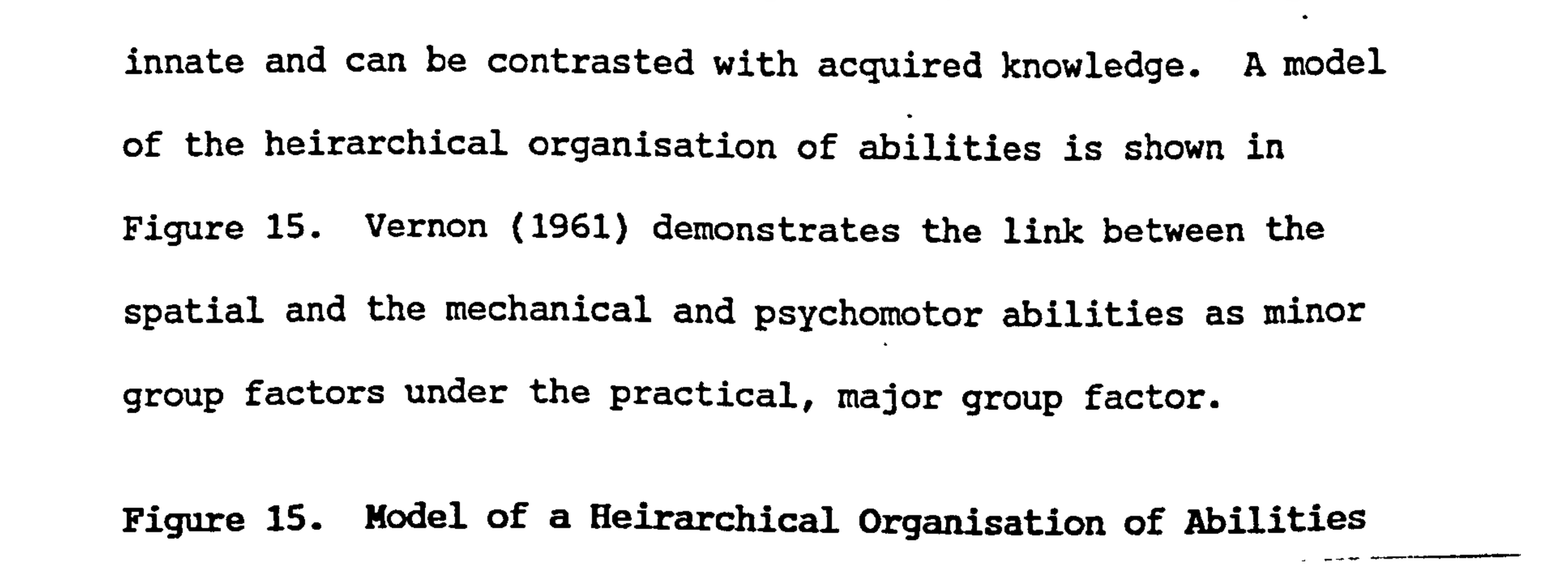
Measurement tools and concepts are used to try and answer these questions. Informal judgements, structured interviews and systematic tests will give information based on past behaviour so that predicted behaviour can be made. The above tests have measured aptitudes, i.e. capacity to attain from learning or training opportunities new kinds or levels of knowledge, skills, abilities or personal characteristics, e.g. mechanical, clerical aptitude, spatial orientation and perceptual speed.

Achievement measures intend to assess what the employee knows, understands or can do in relation to quite specific areas of job knowledge and/or skills. The test may involve an entire task. Another phase of the testing may involve a general intellectual abilities test associated in particular with the visual-spatial aspects of most agricultural work, especially with livestock.

3.4. Psychological Tests

The agricultural industry is very dependent upon the visual-spatial ability/aptitude of its employees and so psychological tests may be used to assess the level of this ability, Anstey (1966). These tests venture into the area of personality and personal assessment. Miller (1975) and Schofield (1972) have reviewed the use of tests in British Industry and Commerce. If training in test use is carried out with and through the Psychological Society then the results and conclusions from tests should be of benefit to firms and also agriculturalists. Visual-spatial ability is the ability to perceive visual-spatial relationships and to manipulate what one perceives mentally. This may lead to an estimate of personnel intelligence - an intellectual or cognitive quality, contrasted with physical or temperamental qualities, which is largely innate and can be contrasted with acquired knowledge. A model of the heirarchical organisation of abilities is shown in Figure 15. Vernon (1961) demonstrates the link between the spatial and the mechanical and psychomotor abilities as minor group factors under the practical, major group factor.

Figure 15. Model of a Heirarchical Organisation of Abilities



Source: Vernon (1961)

The commercial tests available to assess spatial ability are mainly matching tests and choice tests rather than inventive - response tests, e.g. find the odd one out of a group and consider the three dimensional shape created from a two dimensional drawing. This compares favourably with the work situation.

"General intellectual abilities tests may measure the skills already mastered, depending on the content of the test, and may not measure perceptual ability," according to Maslow 1976. Psychomotor and Sensori motor abilities (reviewed in Schofield, 1972 and Maslow) are very important for the agricultural industry where predominantly muscular activities or predominantly sensory activities are used. Dexterity, eye-hand co-ordination and strength and agility are the important psychomotor abilities. Well-developed tests can be considered of value for selection, training and placement including general intellectual abilities work.

These tests should satisfy the following requirements:

1. They are of average difficulty for the population as a whole.

2. They are reasonably short pencil and paper tests, and easy to administer.

3. Every attempt has been made to make them fair to all sub groups within the population of potential test-takers.

Having identified the purpose and intended use of General Ability Tests, it is important to clarify the intellectual attributes which need to be measured and, therefore, the type of questions the tests should include. The intellectual

qualities which are thought by employers to be the most important are:

1. Ability to reason logically.

2. Ability to understand and adapt to new situations and working demands.

It can be argued that the ability to reason logically is a pre-requisite of the ability to understand and adapt to new situations and working demands. Reasoning is the essential tool in everyday problem solving. The question type should be chosen on the basis of two main criteria. Firstly, they should necessitate the use of those mental processes which psychologists have identified as being fundamental to reasoning. Secondly, they should have a good psychometric pedigree, i.e. they have been used profitably in established tests which claim to measure reasoning.

The inter-relatedness of reasoning and problem-solving has been highlighted by researchers such as Sternberg (1982). This all links in with whole concept of "intelligence". Some theorists give reasoning a major role in intelligence models, Spearman (1923) and Oppenheimer (1956) whereas others believe multiple abilities underlie intelligence. Factors such as word comprehension, perceptual speed and memory are viewed as equal in importance to reasoning, Gardner (1983).

Reasoning does involve three facets:

(a) the perception and mental representation of given material,

(b) the identification of categorisation or transformation rules and

(c) the use of such rules to create or choose further instances.

The Spearman work has been corroborated by Guilford (1947) and Sternberg (1977, 1985) and so elements of agreement over the reasoning and intelligence link have been established. The questions used by the various tests have been grouped together and a decision to use text-free measures of reasoning throughout the tests used by the researcher. Four types may be used as identified below:

1. **Classes** - identifying a categorisation rule and then either picking the "odd one out" or choosing further category members.
2. **Analogies** - finding the missing term (D) when given "A is to B as C is to ?" such that D relates to C in the same way that B relates to A.
3. **Series** - determining the rule(s) underlying a given sequence and then producing the next one.
4. **Patterns** - determining the rule(s) underlying an arrangement of shapes or numbers in a grid, then completing the missing cell(s).

The techniques available to assess visual-spatial abilities have been discussed and the main reasons for their consideration in this study are:

(a) they may lead to a greater understanding of the abilities of a stockperson and

(b) they may be a useful tool in assessing the trainability of a stockperson.

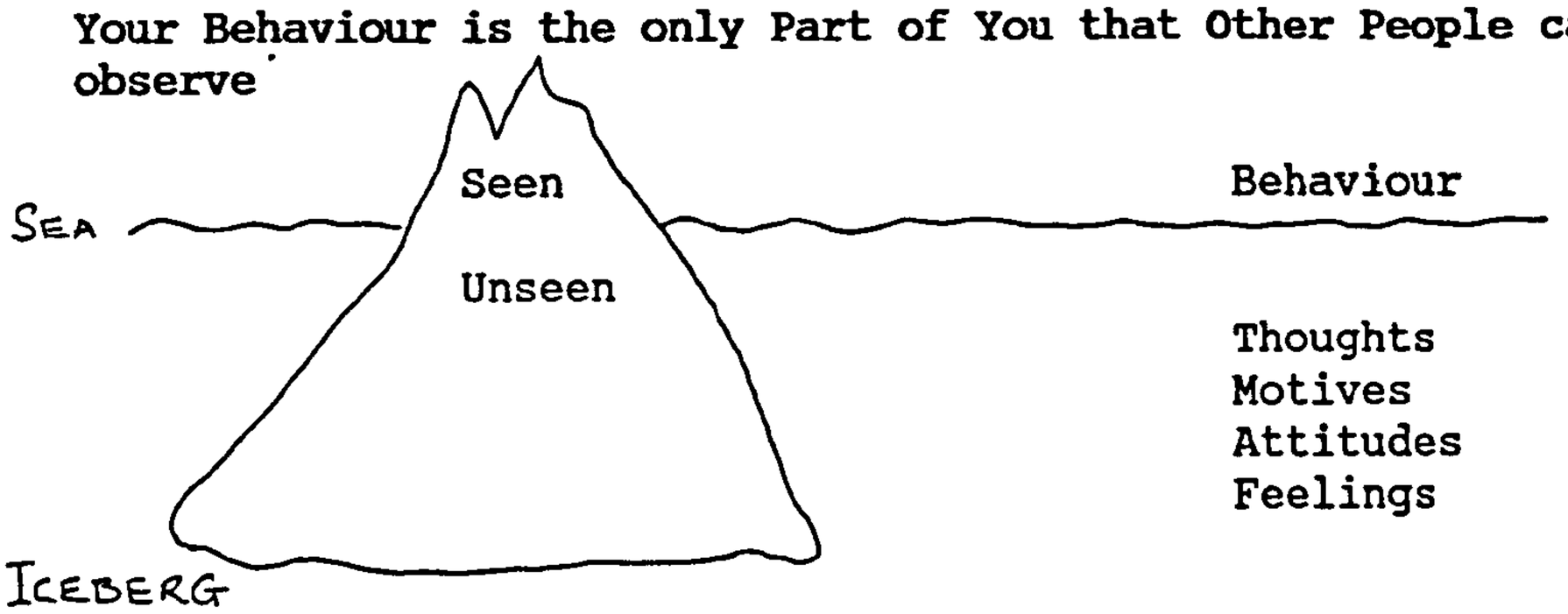
The trainability of employees and the techniques used by the facilitators/instructors who were in charge of the training, is often a major concern of employers. Harrison (1988) notes that

trainability tests can identify individuals who are untrainable or who take too long to train to acceptable standards. The trainability tests are intended to be one of an array of selection instruments rather than a competitor to any other method. Downs (1985) states that the selector should have a wide range of instruments from which to choose. It is a good idea to have these tests for new jobs and where labour is short, otherwise there is a strong reliance upon past experience. These tests help where other methods have not worked and are conscientiously designed to predict better than interviews. They may substitute for a probationary training period and give a taste of the job. The tests may be expensive on instructor time and the range of tests is restricted to a variety of perceptual manual tasks. They are formally set and conducted in a systematic manner, i.e. given in the same way and in the same sequence. Standardised tests produce comparable objective information whereas interviews give objective and subjective data that can be very difficult to separate. Considering the trainability aspects, the work of Miller (1975) suggests that aptitude tests would lead to estimates of potential skills and interests.

However, as shown in Figure 16, behaviour may mask many thoughts, interests, motives, attitudes and feelings. O'Neil (1989) puts the behavioural aspect into the context of the pigperson environment.

Figure 16

Your Behaviour is the only Part of You that Other People can observe



Source: Steward (1987)

For the testing of any techniques to be successful and hence useful to training officers and employer a pilot study testing the questionnaire design in the market place and assessing the market willingness to complete general intellectual tests must be undertaken. The information collected would have to be interpreted and a main study could be carried out and interpretation could be achieved by:

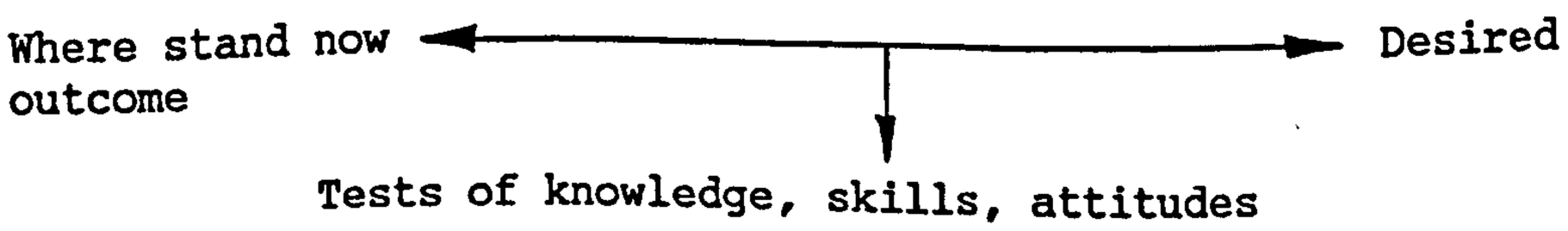
(a) Norm-referencing the data - performance judged against a range of scores made by some defined reference group.

(b) Criterion-referenced - performance related to some standard, e.g. production records.

(c) Content-referenced form - test samples directly from a domain of behaviour, e.g. a skill.

Assessments are available to test how far the trainee has progressed towards the desired outcome, as shown in Figure 17.

Figure 17 - Diagnosis of Training Needs and Present Status



Source: Maslow (1976)

The progress of an employee needs to be tested, including self-appraisal, whilst training is being followed. The retention of the knowledge, skills and attitudes gained from the course must also be monitored carefully.

The tests must be professionally prepared and their use explained by the professional so that a set standard can be set and achieved to show high competence. There will still remain the question of bias, reliability and validity with regard to the tests used, the timing and the trainee's reliability.

3.5. Sources of Bias and Error

Measuring learning effects through testing, whether self-assessment or not, requires accuracy and an ability to interpret the meaning of the measurement. A test is valid if it measures what it is intended to measure. It is reliable if it does so consistently according to Drawburgh et al (1971). Before a consideration of these latter two aspects takes place, a recognition of the problem of any bias must be made.

Girdler (1984) and Scriven (1976) review six of the most common problems due to bias. These are:

(a) The extreme response set.

(b) Error of central tendency.

(c) Halo effects.

(d) Logical rating errors.

(e) Contrast and similarity errors.

(f) Leniency errors.

Hence the study technique promoted and perfected by Ralph and Howard attempts to eliminate these and the "response-shift" bias. This is a real problem with "before" and "after"

training testing. Warr, Bird and Rackham (1970) and Linn and Slinde (1977) noted that the Pretest can alert the trainee to the Post-test format and so skew the results from a normal distribution. This form of Pretest contamination may give a clue towards highly effective training with low retention levels and poor impact upon employee productivity. The response-shift refers to the new reference point of the trainee after training compared to before training. The self-reported improvement may be small based on this new perspective of knowledge, skills and attitude levels. The work of Ralph (1975) and Howard (1979 a and b, 1980) demonstrates the importance of this bias and the way in which the Then-now report system has improved the credibility of self-reported attitude, both before and after a training course.

3.6. The Problem of Validity

Rutman and Mowbray (1983 and 1980) are quoted as questioning "Are you going to measure the right things?" Validity involves the following considerations/areas:

1. Consensus - several experts agree that it is the way to do it.
2. Content - it should produce a reasonable sample of all possible responses, attitudes and behaviours.
3. Construct - the degree to which scores on a proposed measure permit inferences about underlying traits, attitudes, behaviour, probabilities and the like, Reynolds (1989)
4. Concurrent - do the scores or responses from the data collected correlate with generally accepted and accurate standards?
5. Internal - history, maturity, testing, group selection and mortality effects.

Rutman (1980), Maslow (1967) and Nunnally (1975) also consider the following questions:

(a) How adequate is the definition of the concept being measured? Can one use government data?

(b) Is the measurement procedure relevant for the programme's goals?

(c) To what extent are proxies valid indicators?

(d) To what extent are proposed measurement procedures likely to affect the validity of the data?

- Guinea-pig effect,
- role selection assuming a different role to normal,
- testing effect, i.e. the questions prompt real change in the phenomenon being measured,
- response set, i.e. respondents endorse statements rather than disagree with opposites - interviewer effect.

(e) How will non-response be handled?

Holdsworth (1972) considers the notion of test validity can be understood by its correlation with the attribute it aims to measure and with whatever we want to maximise, whether this is output at a given job, success in training course, length of job tenure or any other definable behaviour. Work carried out by the Further Education Unit (1985 a and b) concludes that typically one can expect correlations of 0.4 to 0.7 when a test is predicting success on a course and 0.4 for prediction of success on a particular job. The main problem would seem to be "taking the test seriously". Consideration should now be given to the problems associated with reliability.

3.7. The Problem of Reliability

Maslow (1976) continues to contribute to the concept of the necessity for evidence of reliability in any measurement technique, i.e. "true score" plus errors in measurement. There are many conditions that can affect errors, e.g. individual's interests, state of mental and emotional health at the time of testing and course attendance and the degree of preparation for the test situation. If the measures are not reliable then it is difficult to make judgements on the basis of this information. Rutman and Mowbray (1983) look at the decision areas for managers who wish to construct reliable tests for the evaluation of training, e.g. the correct wording of questions to give the information required. Hamblin (1985), whilst considering teaching and training methods, considers the techniques to be employed at the various levels of training, e.g. reaction, learning, job behaviour and functionary level. The validity and reliability depends upon the matching of evaluation tests with the training.

The FEU publication on "Testing for Learning" (1985) suggests that reliability will be low if the test is too long or has ambiguous questions. Coefficients of 0.9 can be achieved and ought to be greater than 0.7 to use the test anyway.

Rutman (1980) lists the reliability problems associated with the planned data collection procedures as:

1. vague categories,
2. haphazard recording,
3. distortion of records when they know it is going to be used for evaluation,
4. difficulties in coding narrative case records.

He continues by suggesting two major precautions to ensure the required level of reliability. They are:

1. pretest the question, e.g. in a pilot study,
2. get practitioners to keep good records.

Three further general factors are instrumental in affecting the feasibility of collecting valid and reliable data. They are:

(a) To what extent will political factors undermine efforts to develop and implement valid and reliable measures?

(b) Are there major obstacles in obtaining the necessary data?

(c) What are the cost implications for obtaining the required information?

Bearing in mind all of these practical considerations Holdsworth (1972) maintains that reliability depends on the extent to which candidates would have achieved the same score if they had taken the same test on a different occasion or a similar test. Even reliability is subject to interpretation according to Newstrom (1987). He has pinpointed at least six different ways in which reliability can be interpreted, and trainers need to be prepared to experience potential anomalies in evaluation: abnormalities, irregularities or deviations from the expected results. Respondent rift, right time-wrong place and vice versa, first impressions, opposite group responses, small sample responses and expectation versus reality are all typical areas where anomalies and deviations can occur.

CHAPTER 4

INVESTIGATIONS INTO THE PARTICIPANTS IN A NUMBER OF TRAINING COURSES/INITIATIVES

There are many research designs and data collection techniques suitable for investigating the effect of training upon participants in their own discipline. The following section pursues the process of sorting out methodologies that are best suited to collecting information on objective and subjective criteria required to evaluate its effectiveness. The technique must be matched to the level of training and area of training to be measured, e.g. knowledge, skills and attitudes (behaviour). With the research tools analysed, the pilot study and main project commenced with two groups of experienced pigpeople on ATB Training initiatives. The experimental design and data collection techniques were matched to provide data to test the hypothesis. The content and establishment of the courses is discussed with the method of evaluation.

4.1. The Pilot Study - Pigpeople Training Group

The Training Officer in the East Anglian region found that there was a requirement for a training group for pigs to be set up. The group members were sent an ATB Pig Enterprise analysis sheet and requested to return it to the Training Officer. A copy of an analysis sheet can be found in Appendix A. There are five main areas to be completed so that a full assessment of the business/enterprise can be made. The concept used is that of assessing performance, deciding priorities and then selecting the appropriate training. Initially the Strengths, Weaknesses, Opportunities and Threats for the enterprise (SWOT analysis) are fully explored so that the analyst can build on

strengths, minimise the weaknesses, build on the opportunities and avoid the threats. The second section reviews the enterprise targets and requests the desired performance of the participating unit. The third area concentrates upon the key jobs and decision areas and also highlights the individuals within the pig unit who are responsible for these tasks. Assessing the individual staff levels in management skills, knowledge and attitudes is the fourth section. Finally the farmer or pig unit manager completes a priority selection list with 5 - 10 training needs that have been highlighted by the assessment. This section should select the person to go on the course, what they should be taught, why they are going, when they can attend and how best these needs can be met by the Group Training Officer.

Ten people completed these forms and returned them for analysis by the Training Officer. Discussion areas were selected from the replies and the local Training Officer arranged for four to five speakers to provide a programme of training days from December to July based on new ATB work books. The first course was set up and designed for farmers and employees keeping pigs within an East Anglian Training Group. The ATB sent out invitations to all pig farmers to attend this series of day courses. A programme of events, dates and lecturers was mailed with the invitation as shown in Figure 18.

Figure 18 Programme of Subject Days

28 Jan	Service Management	ADAS Pig Specialist
11 Feb	Disease Control and Prevention	" " "
25 Feb	Overcoming Farrow Problems	Local Vet
11 March	Reducing Piglet Mortality	ADAS Pig Specialist
8 April	Housing and Environment	" " "
6 May	Care of Sows and Weaners	" " "
3 June	Records and their Use	Training Officer
1 July	Aiming at Maximum Conception	LocalVet

Eight people arrived at the centre for the first session in January 1987. It was hoped that this would be a forerunner of many pig enterprise groups. This course was used as a pilot study to establish the validity of the favoured techniques mentioned in Chapter 3.

The main objective of a pilot study is to establish the most suitable technique in its most suitable format to assess the problem. A large element of re-testing, particularly question design and layout, will be used to establish a design to meet the researcher's requirements. With a low course attendance, the group formed a case study with the factual and judgemental data collected using questionnaires. These questionnaires had to be designed for speed of completion with a high degree of objective and subjective accuracy depending on the type of question asked.

4.1.1. The Then-now Questionnaire

It was decided by the researcher to use a post-test design, with a pre-test assessment included using a self-administered questionnaire where possible and TGO administered otherwise.

The objectives were:

(a) to collect factual and judgemental data easily and reliably as a basis for possible correlations,

(b) to establish the participants' estimated position before the course, once the course had run, to show the change over the course duration (Then),

(c) to establish the participants' position "after" the course (Now).

A questionnaire was used along with a covering letter, Figure 19, to reduce interviewer bias when answering certain questions. The self-administration allowed the evaluator to stress the confidential nature and accuracy requirements along with the link to a project based at Nottingham University.

Figure 19. The Letter to Accompany the Mailed Questionnaire

Dear Mr

In my discussion with the group, at one of the sessions of your training course, I requested your help in trying to evaluate the usefulness of this series of lectures and practicals. I mentioned that a short questionnaire was being prepared for you to complete at the end of the training period.

If you agree to assist me in this study, then the information collected will be kept in strictest confidence and only used in an anonymous form within a thesis in the library at Nottingham University. The same questionnaire will be used with other pig courses run in the region and all the data will be summarised to support the idea that training for adult, experienced, agricultural employees is both effective and valuable to those individuals.

If you can spare a few moments to complete the questionnaire and return it to me in the prepaid envelope, I would be very grateful.

Yours sincerely

Derek Girdler

Pilot work is very useful and vital for testing question sequence, type, content and design. The knowledge based questions were closed in design and tested instant and delayed recall. Closed questions were also used to collect unit performance data. The self-judgement questions were asked concerning ability to complete a task and confidence to "do it

well". These questions gave a scale of response to suit the self-rating of the individual person.

The scales rated from "0" for "no-confidence-not done job yet" to "5" for "very-confident. The data collected fell into three categories:

(a) Production records - Question 1:

Q1. Would you please complete the following table of data from your pig unit recording scheme.

Breeding Unit	Past 6 months	*	Present 6 months
Litters/sow/year		*	
Pigs born alive/litter		*	
Pigs weaned/litter		*	
Pigs reared/sow/year		*	
Quantity sow feed/sow/yr		*	
Feeding (fattening) Unit		*	
Quantity feed/pig reared		*	
Average weight gain		*	
Feed conversion ratio		*	
Feed cost/kg livewt gain		*	

(b) Tests of knowledge retention - Question 2:

Q2 You have now attended a series of short day courses and I would appreciate your estimation of any increases in knowledge that you can say are due directly to the lecturers/vets talks. Please mark with a cross on the line the number which best describes your level of knowledge on the subject areas below ("before and after" the course), full copy in Appendix B.

e.g. 0_____5

There is a total of 15 rating scales (a-o), Appendix B.

		No knowledge yet	Complete knowledge
(a) Preparation of the sow before service	(before)	0	5
	(after)		
(b) Managing services	(before)	0	5
	(after)		
(c) Recognition of disease symptoms	(before)	0	5
	(after)		
(d) Prevention of diseases	(before)	0	5
	(after)		
(e) Hygiene required at farrowing	(before)	0	5
	(after)		

(c) **Judgemental data on confidence and ability - Question 3:**

Q3. As an adult, experienced, agricultural employee, you will have varying levels of confidence in the topic areas discussed on the subject days. I would appreciate an estimation of your level of confidence in the following 15 topic areas and request that you put across on the line/scale provided. One line will show your confidence level (before) the course and the second line underneath will indicate your present estimated confidence level.

		No confidence not done the job yet	Very confident
(a) Preparation of the sow before service	(before)	0	5
	(after)		
(b) Managing services	(before)	0	5
	(after)		
(c) Recognition of disease symptoms	(before)	0	5
	(after)		
(d) Prevention of diseases	(before)	0	5
	(after)		
(e) Hygiene required at farrowing	(before)	0	5
	(after)		

Rating scales must be prepared with great care and form a very interesting part of this data collection. The analysis of the data can be used to concentrate on differences between participants and this summative scaling is respondent-centred. The herd physical data can be correlated with confidence scores to see if knowledge and skills in certain areas affect performance levels. There are many problems and limitations with using this technique and they are:

(a) The extreme response reply (scores 5 for every question).

(b) The Halo effect (what the researcher and tutor wants to find).

(c) The representation of one's lack of skill to a third party.

(d) The response-shift bias is underestimated.

The respondents were given the questionnaire relating to the areas covered on the subject days at the end of the session. Some questionnaires were completed immediately and other pigpeople, unable to stay any longer, completed them at home and returned them in stamp addressed envelopes. The response rate ranged from 90%, for the questionnaires that were administered by the researcher with a full explanation, to 50% when tutor-administered with limited explanation. This level of variation is often due to the lack of time and effort given to the explanation by a tutor who is not directly involved in the research study even though they are sympathetic to the work being carried out.

4.1.2. Post-course Questionnaire

A post-course questionnaire, a copy is shown in Appendix B, was also designed using some similar questions and asking for herd

herd physical and financial data along with some reassessments of confidence and levels of retained knowledge and skills.

This questionnaire was mailed two years after the start of the course and the total response rate was 58% with usable complete replies of 30% as shown in Figure 21 (some replies could not be used due to trainee having changed profession and/or enterprise employment - 28%)

The Pilot study lead to changes in question design and type so that knowledge and skills areas could be readily scored to show increases or otherwise in these areas. The physical data would be available from a central source in the case of large company training schemes.

4.2. The Methods used for Evaluating Pig Enterprise Training

The main assessment occurred with a second pig enterprise training group. The participants were mainly employees from one very large pig company with large pig units under six separate pig unit managers. Two other large companies also sent two people each on the one day per month training sessions, Figure 20. It was all ATB sponsored and the tutor used ATB Pig Training Handbooks as the basis of taught material and style of delivery. The programme was the following:

Figure 20 Programme of Subject Days

Day 1 Basic Pig Health
2 Condition Scoring for Sows
3 Infertility in Pigs
4 Boar Care and Effective Service
5 Aiming at Maximum Conception
6 Practical Gilt Selection
7 Disease Control and Prevention
8 Reducing Piglet Mortality

The pig unit managers chose the staff and the trainees were usually a different group for each subject day. A timetable of data collection was established by the researcher, Figure 21.

Figure 21. Timetable for Data Collection

Training for Pilot Study Pig Group 1986/87 (Norwich Area)

SEPT-NOV 1986	ATB personnel audit sent out to assess Pig Group training needs
JAN 1987	Pig courses started, programme Figure 18
JAN-JULY 1987	Then-now questionnaires used after each day length course. (80% return on average)
JULY 1989	Then-now questionnaire (30% return usable)

Main Training Groups for Pigs - 3 groups 1987-1990 (Thetford Area)

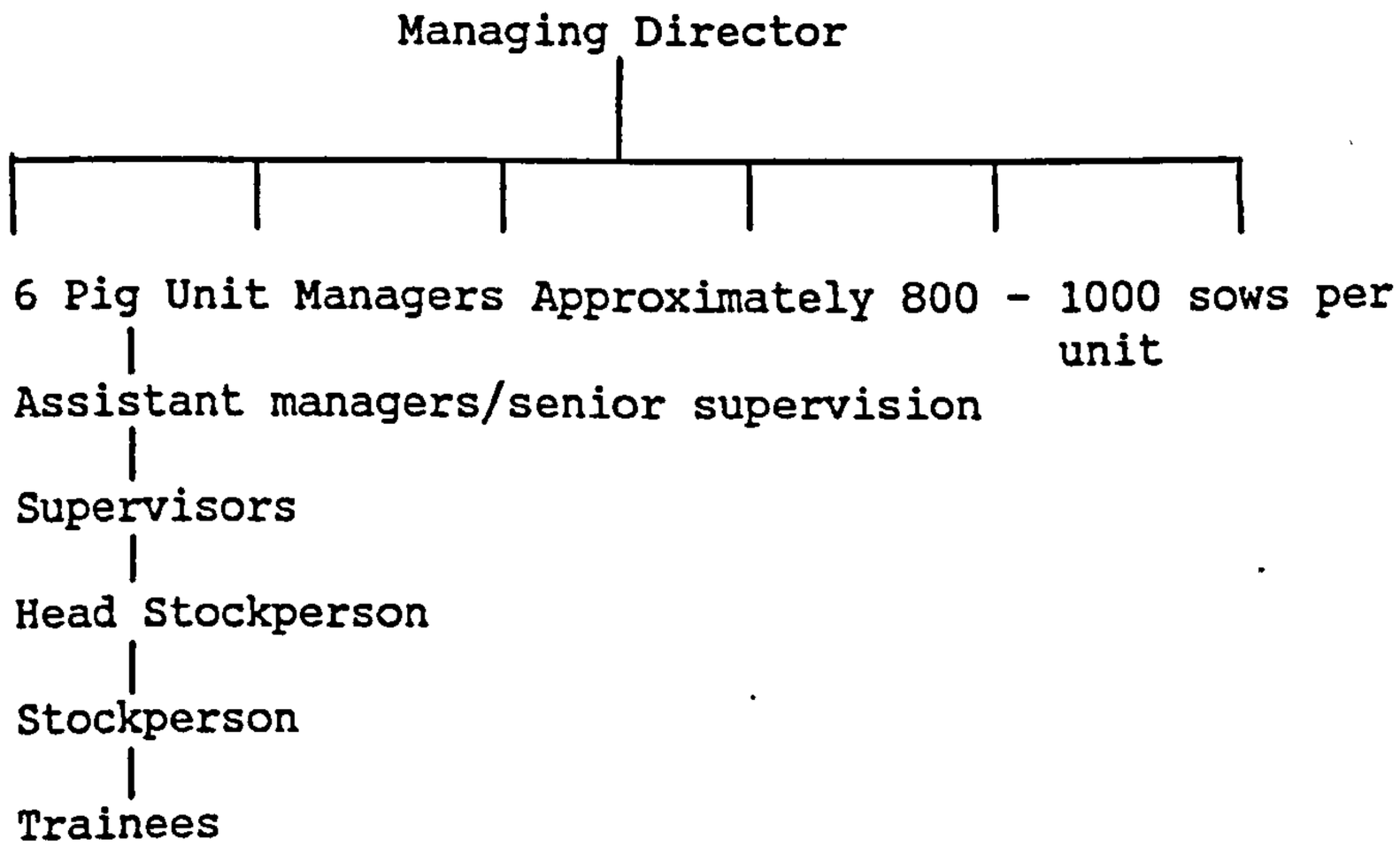
JULY 1987	Pre-course Questionnaire for Unit Managers who directed staff development
OCT 1987	8 Pig courses started, one every month, Figure 20
SEPT 1987 - MAY 1988 Group 1	Pretest questionnaire used for 5 out of 8 subject day sessions Then-now questionnaire self-administered (85% return on average)
OCT 1988	COURSE ATTENDERS 1987-88 CONTROL STOCKPEOPLE Visual spatial ability test for both groups (100% return)
OCT 1988	Then-now questionnaire administered at the same time 6-12 months (100% return) after courses completed.
OCT 1988 - MAY 1989 Group 2	Then-now questionnaire administered after each course day (91% return)
OCT 1989 - MAY 1990 Group 3	Then-now questionnaire administered after each course day (75% return)

N.B. For the 1988/89 and 1989/90 courses only five of the subject days shown in Figure 20, were run by the tutor.

4.2.1. Pre-training Interview For Pig Unit Managers

The interview was designed to establish the methodology employed by unit managers for selecting staff for training for certain modules. It was also used to look into the follow-up procedures after training and any continuous staff appraisal system. The large pig company has a staffing management structure from trainees up to the unit managers and finally managing director, Figure 22.

Figure 22 Management Structure for Pig Company using the Training under Assessment



Assistant Manager/ Senior supervisor	- responsibility for a complete section of farm as well as farm in manager's absence - marketing, feed, pig movement
Supervisor	- responsible for unit normally 1 or 2 people under person
Senior Stockperson	- seniority often due to years of service - look after the section on their own and responsible to assistant manager or manager directly
Stockperson	- completed ATB craft courses and paid craftsman's rate
Trainees	- training to be a stockperson and trying to pass craft certificate

Training within the ATB training system provides the apprenticeship for trainees to move up to stockperson, senior

stockperson, supervisors and assistant unit manager. The objectives of the pre-training interview were:

(a) To establish whether there is a system for monitoring the knowledge, skills and attitude levels of staff on the pig unit.

(b) To assess the middle management approach and attitude to training of staff appraisal.

(c) To establish the basis upon which decisions are made to send certain personnel on courses and the follow-up procedures pursued on return to work.

The questionnaire was self-administered at an interview with unit managers on an individual basis, a copy is shown in Appendix C.

The return was 100% and the forms were completed carefully and "frankly", bearing in mind the nature of the research work and the total confidentiality of any views expressed. The data collected is analysed in the following chapter.

The questions asked at the interview are listed below:

1. How many people do you have on your unit?
2. What is the unit organisational structure?
3. How often do you have meetings with your staff?
4. How often do you discuss the performance and finances of your unit with the staff?
5. What do you feel about the training that is being offered to your staff at the moment?
6. How would you improve it?
7. Do you have a formal report-back session for each member of staff attending training courses?
8. How do you assess who needs training and in what?
9. Do you feel that a questionnaire should be completed

after each subject day session to assess the effectiveness of that training?

10. Do you have a positive attitude towards training or do you feel that you could teach them everything they need to know on their own units?

The interview was informal and the questions were answered very honestly and as succinctly as possible. The questions that were asked required some factual data, e.g. Questions 1, 3, 4 and 7 and some indications of the various approaches used by the managers to staff development through training and personal improvement, e.g. Questions 8, 9 and 10. The answers to all these questions were collected together so that a review of the unit manager's attitudes to training could be evaluated.

The selected employees were then sent on specific subject days to have training in topics related directly to the tasks that they were performing on the pig unit. The whole concept was to improve their knowledge and skills in certain areas and to enhance their attitude towards their job, colleagues, the pigs, the Company and its employment package. On each subject day, most of the course attenders were new so it was decided to produce eight questionnaires based on the material covered by the tutor in the ATB work books. The questions were designed to test knowledge, skills and attitudes gained from the training experience. With the 1987/88 group, the researcher tried to Pretest the group to assess the existing levels and at the end of each session to use a Then-now questionnaire to re-assess these levels. The Pretest questionnaire asked the same questions as the Then-now but this assessment was made by the trainees "before" the course started. The Then-now asked

for an assessment of knowledge, skills and attitude levels both "before" and "after" the course, at the end of the daily session, a copy is shown in Appendix E.

4.2.2. The Pre-Then-now Questionnaire For Each Session

At the first session, the self-administered Pretest Questionnaire was given to the pigpeople and its purpose explained fully. The 100% return rate was due in part to the explanation and the stress laid upon total confidentiality and the Nottingham University links. At the end of the day the Then-now questionnaire was handed out. The objectives for using this approach were:

(a) To gain the full support of every pigperson.

(b) To stress the use of these assessments beyond the project.

(c) To stress the valuable research work in a difficult area.

(d) To be available to answer questions during the day.

The questionnaires were similar to the pilot study with some restructured and deleted questions, shown in Appendix E.

The objective of the Pretest and Then-now questionnaires were:

(a) To establish the pigpeople's knowledge, skills and attitude levels, which varies throughout the group, "before" and "after" the training.

(b) To re-establish their initial confidence levels bearing in mind the response shift bias due to course attendance, i.e. re-assessment of the initial knowledge, skills and attitudes base.

(c) To establish the physical and confidence data before and "after" the course to assess the impact of the course upon employee performance.

A copy of the actual questionnaire presented to the pigpeople is shown in Appendix E and selected questions are used to illustrate how the data was collected. The questions established the following three areas of data collection.

(i) Factual knowledge questions concerning the subject areas taught on that day,

(ii) Self-Rating of each pigperson to perform skills,

(iii) Self-Rating and assessment of attitudes towards Management and the benefits gained by training.

Before using these examples to illustrate the areas of data collection, a diagram illustrating the methodologies used in the data collection is shown in Figure 23. It shows clearly the various stages of data collection from the Pilot study in 1986/87 through to the evaluation of three training groups in 1987/88, 1988/89 and 1989/90 that make up the main training group for pigs.

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Figure 23 Methodologies used in Collection of Data for Evaluating the Effectiveness of Training Pigpeople

	PILOT STUDY	MAIN TRAINING GROUPS	
Timing	1986-87 Course	1987-88 (Group 1) Course	1988-89 (Group 2) and 1989-90 (Group 3) Courses
Place	Norwich Area	Thetford Area	Thetford Area
Population	Pigpeople from small to large units	Pigpeople from large units forming part of a large pig company	Pigpeople from the same large company as 1987-88 course
	Stage I - access to ATB personnel audit for each unit's staff attending the courses - self-administered **Then-now** questionnaire	**Stage III** - Questionnaire for unit managers plus collection of unit physical performance data 1986-90	**Stage VII** - (1988-89) **Then-now** questionnaire - self-administered on as many occasions as possible otherwise handed out by course tutor
	Stage II - mailed **Then-now** questionnaire 2 years after training	**Stage IV** - Pretest and **Then-now** self-administered questionnaire for course attenders 1987-88	**Stage VIII** - (1989-90) **Then-now** questionnaire for course attenders mailed and handed out by course tutor after each training day
		Stage V - Visual spatial ability test plus re-assessment of the knowledge, skill and attitude levels from the **Then-now** questionnaire above (6-12 months after training)	
		Stage VI - **Then-now** questionnaire and visual spatial ability test used with Control group - large pig unit	

The questionnaires used in this study have been designed to collect data associated with the levels of knowledge skills and attitudes of the trainees. An introduction to the questionnaire outlines its importance to this research study

Questionnaire for Course Attenders

You have just attended a course on ..... and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockpeople like yourselves. (Please cross out the response to a question that does not apply). The questions used to collect the three areas of data already mentioned are now discussed in the text.

(i) Factual knowledge questions concerning the subject area of the training day, e.g. Q1-6.

Q1. The boar is 25%, 50%, 75% of the herd in terms of importance. (cross out the % not applicable).

Q2. Please complete the following paragraph (usually only one word required.

The service pen design is very important and the size should be .....sq. ft with only a few ..... The area should be well ventilated but ..... free. The floor should be well ....., non-....., insulated with ....., if it is available, on the floor, otherwise slated floors will do. Partitions should be .....ft tall and gates barred..... Troughs and drinkers should not stick out from the wall. Good lighting is vital.

Q3. Please answer the following question by crossing out the wrong response.

The boar should be brought into the sow pens? **True/False**

Boars should never be switched due to scent changes? **True/False**

Boars should not be fed less than 16% protein rations? **True/False**

Boars older than 1 year should receive 8-10 lb food per day? **True/False**

The physical condition of boar should be "well fed and contented"? **True/False**

(Boar Care and Effective service)

Q4. How do you find out if it is the boar or sow which is contributing most to infertility?.....

.....

Q5. How would you control and outbreak of SMEDI? (tick the appropriate measures introduced)

TICK

Build up immunity in the herd
Feed foetal material but at the correct time in breeding cycle
Lack of stress and good management
System to introduce purchased gilts
Don't buy "in-pig" gilts
Vaccinate

(Infertility in pigs)

Q6. Do you think that you now have more knowledge to spot the unhealthy pig? (Please score your assessment of your knowledge before and after the course using a "X" on the line between 0 and 5)

0 5

---------- before the course

---------- after the course

(Pig Health and Disease)

(ii) Self-rating of each pigperson to perform certain skills/tasks which are normally associated with subject under discussion, e.g. Q7 - 9.

Q7. Do you perform any of the following operations on the unit? Yes or No. (after each operation would you please give yourself a score between 1 and 10), e.g. Do you drench pigs? Yes/No (6)

Do you castrate pigs?	Yes/No( )
Do you inject pigs?	Yes/No( )
Do you tail dock the pigs?	Yes/No( )
Do you teeth clip the pigs?	Yes/No( )
Do you use ear tattooing?	Yes/No( )
Do you foot trim the sows?	Yes/No( )

(Pig Health and Disease)

Q8. Please assess your skills at the following tasks after the course; (circle the level of skill that you think applies to you)

		No Experience					Fully Experienced
(a)	Do you take temperatures?	0	1	2	3	4	5
(b)	Do you do any foot-paring	0	1	2	3	4	5
(c)	Do you inject sows and boars with vet's guidance?	0	1	2	3	4	5
(d)	Do you footbath sows/boars?	0	1	2	3	4	5
(e)	Do you condition score sows?	0	1	2	3	4	5

(Boar Care and Effective Service)

Q9. "Feeding seems to be the key to condition and sow productivity". Do you feel that you can now feed correctly to achieve the required condition? Please score your feeding skills on the scale provided with an "X".

	0	5
after the course	*----------	----------*
before the course	*----------	----------*

(Condition Scoring)

(iii) Self-rating and assessment of certain attitudes towards management and the possible usefulness of the increased knowledge and skills on their own units e.g. Q10 - 12.

Q10. What would you look for in the selection of gilts? (Tick the important factors and score your ability to assess these features on a scale 0-6)

Performance	TICK 0-6	Appearance	TICK 0-6
Parents of gilt	( )	Fatness of the carcase	( )
Weight for age	( )	Sound legs	( )
MLC Test index of merit	( )	"Weakness" in conformation	( )
FCR	( )	Poor stance	( )
Temperament	( )	Six teats each side	( )

(Practical Gilt Selection)

Q11. What use should we make of records? Assess your level of confidence at using the records to do the following score 0-5.

	0 5	
Planning/Checking production	*----------*	Before
	----------	After Course
Reproduction data	*----------*	Before
	----------	After Course
Monitoring disease	*----------*	Before
	----------	After Course
Check food conversion ratios	*----------*	After Course

Q12. In what other ways can I make use of my vet to increase efficiency and profitability? List some areas of advice that you can obtain from the vet.

.....
.....
.....

(Disease Control and Prevention)

The difference between the pilot work and the main pigpeople's questionnaire are:

1. The removal of any form of identity apart from a set of initials.

2. The re-wording of one or two ambiguous questions and inclusion of some Yes/No and True/False statements in the knowledge sections (see knowledge questions p 80/1)

3. The use of some numbered scales as opposed to all un-numbered rating scales for the attenders to mark (examples of completed scales are shown p 82)

4. Pig unit details were not requested because the men are part of a large team and this data was collected centrally. However certain figures were asked for in the questionnair and a wide estimate of these factors was given by individuals.

The response rate was high (85% shown in Figure 21) for most subject days although attendance varied due to demands upon the men from their unit managers. The Pretest questionnaire used some Then-now questions and unfortunately was only employed if self-administered (5 out of 8 days). The Pre-then-now data was usually fully detailed with seemingly fair self-rating. The resulting data is analysed and discussed in the following chapter.

The data collection, timetable and methodology collection, shown in Figures 23 and 24, indicate that the 1988/89 and 1989/90 courses were also tested. The researcher decided to make use of the Then-now only measurement. The main reasons for discontinuing the Pretest questionnaire were:

(a) the tutor was unhappy with the upset at the start of a session,

(b) the results obtained for the 1987/88 group matched with the research method findings of Ralph (1975), Howard et al (1979) and Mezoff (1981) who also discontinued the Pretest after comparing the results,

(c) the researcher was unable to attend at the start of every session.

This decision has some disadvantages as shown in Chapter 3 but was more feasible for data collection than a Pretest plus a Then-now questionnaire. Each subject day was evaluated with some mailed questionnaires being given out by the appropriate unit managers for the 1989/90 course only, Figure 24. The response rate was about 70% for usable replies with 81% returning forms. The researcher decided to introduce one or two extra questions probing further into the perceived levels of confidence, knowledge and skills of each pigperson.

Figure 24 Data to be collected from the Main Training Group in a Study of Effectiveness of Pig Training for Experienced Agriculturalists (Thetford Group)

	Stage IV (1987-88, Group 1)	Stage V (1987-88, Group 1)	Stage VI Control Pigpeople	Stage VII (1988-89, Group 2) Stage VIII (1989-90, Group 3)
SOURCE :	Pretest questionnaire self administered on 5 out of 8 subject days	Visual spatial ability test	Visual spatial ability test	Then-now questionnaire, tutor administered after every subject day with some follow-up by unit managers (Then-now questionnaire - Appendix H)
:	Then-now questionnaire self-administered	Re-assessment of Stage IV Then-now questionnaire self-administered	Then-now questionnaire self-administered at interview	
DATE :	After each subject day	1 year after course completed	Summer 1988 and 1990	After each subject day
COMPLETED:	Returned by post if not self-administered (SAE provided)	On the visit day to the pig unit	On the visit day to the pig unit	Returned by post in the SAE provided
DATA COLLECTED:	(a) Knowledge data	(a) Visual spatial ability assessment	(a) Visual spatial ability assessment	(a) Knowledge data
	(b) Skills evaluation	(b) Re-assessment of knowledge, skills and attitudes	(b) Assessment of knowledge, skills and attitudes	(b) Skills evaluation

Most of these questions tended to use rating scales as they were found to be less restrictive than the numbered scales, e.g. 0 1 2 3 4 (circle the level of confidence). This was found to be a very good method of collecting levels of knowledge, skill and attitudes before and after the subject day sessions. Examples of the new questions are shown below with the full questionnaire to be found in Appendix E and F.

Question

Please assess your level of knowledge and confidence in the farrowing house using the following rating scales:

KNOWLEDGE Level on Causes of piglet mortality	Before course	0----------5
	After course	0----------5
CONFIDENCE Level on improving farrowing conditions	Before course	0----------5
	After course	0----------5

Question

How confident are you at recognising and dealing with an outbreak of E.Coli. Please score your ability on the scales below.

KNOWLEDGE level to recognise symptoms	Before course	0----------5
	After course	0----------5
CONFIDENCE level to deal with disease	Before course	0----------5
	After course	0----------5

(Reducing Piglet Mortality)

Question

Please assess your level of awareness of disease being brought into the unit from outside. Score on the scales provided.

AWARENESS OF DISEASE	Before course	0----------5
	After course	0----------5

Question

Please assess your level of knowledge on the spead of disease within the unit. Score on the scales provided.

KNOWLEDGE OF DISEASE SPREAD	Before course	0----------5
	After course	0----------5

(Disease Control and Prevention)

Question

How confident are you that you could recognise and deal with the following diseases? Please assess your level of knowledge and confidence to sort out these problems - give yourself a score between 0 and 5).

	KNOWLEDGE		CONFIDENCE	
	Before course (0-5)	After (0-5)	Before Course (0-5)	After (0-5)
Erysipelas	( )	( )	( )	( )
Rhinitis	( )	( )	( )	( )
Aujeszky's	( )	( )	( )	( )
Parvo Virus (SMEDI)	( )	( )	( )	( )

(Infertility in Pigs)

Question

Do you now feel that you have increased your level of knowledge and skills in the area of improving conception rates? **YES/NO.**

If "YES" then please rate your overall improvement on the scales below.

KNOWLEDGE level	Before	0----------10
	After	0----------10
SKILLS level	Before	0----------10
	After	0----------10

(Aiming at Maximum Conception)

Some of the responses and discussion with the unit managers in 1987 seemed to shed some doubt upon the applicability and trainability of some of the staff who attended these courses. The whole area of trainability has been discussed in Chapters 1 and 2 and it was decided to run some visual-spatial psychological tests with the 1987/88 group to see if the responses to the questionnaire related significantly to the results from these new tests. At the same time, October 1988, it was also thought to be useful to re-evaluate some of the rating scales and even some of the factual questions as it was 6-12 months after the courses had been completed.

4.3. The Visual-Spatial Ability Assessment and Re-assessment of Then-now Questionnaire (One Year After Training 1987/88 group)

4.3.1. Visual-Spatial Ability Assessment

The visual-spatial ability assessment was self-administered by the researcher on the visit date, as Stage V of the data collection, Figure 24, and some sections were completed and sent on later. The test employed was a commercially available package with its own rating scales for the scores achieved by the individual pigpeople, copy in Appendix G. The objectives of using this type of test were:

(a) To assess the level of visual-spatial ability.

(b) To assess the trainability of the individuals sent on the courses.

(c) To establish the ability of pigpeople to cope with such tests.

The results were interesting and are analysed in the next chapter. A copy of the type of test used is shown in Appendix G.

The data collected on visual-spatial ability scores is analysed in Chapter 6. Some examples of the visual-spatial tests used in the study are shown in Appendix G and discussed in the next chapter.

4.3.2. Then-now Questionnaire - Re-assessment

The main objective behind this short questionnaire was to obtain the level of knowledge retention and an assessment of the confidence in the skills and attitudes gained on the training days and form Stage V, in Figure 24, of the data collection process. The questionnaire only had two sections:

(a) Short closed questions on knowledge areas.

(b) Self-ratings on confidence levels in certain skills and attitudinal areas, copy in Appendix H.

The response rate was 100% due to self-administration by the researcher.The pigpeople were also asked if the course material had been used by them subsequent to their training. They were requested to comment upon any follow-up that had been undertaken by their unit management. This was a question posed to the unit managers before the staff commenced any training in 1987. The response rate was 100% due to interview type situation. With all this data it would be possible to compare course attenders with the control group who have never attended enterprise training but were reasonably equivalent with regard to age, experience, herd size (within a large private pig company), previous education and status. A pig company was contacted with large herds forming part of the overall high total sow numbers. The company is not a member of the local ATB Training Group and so no training is followed apart from internal on-the-job supervision. A more detailed account of the work carried out with this group is recorded later.

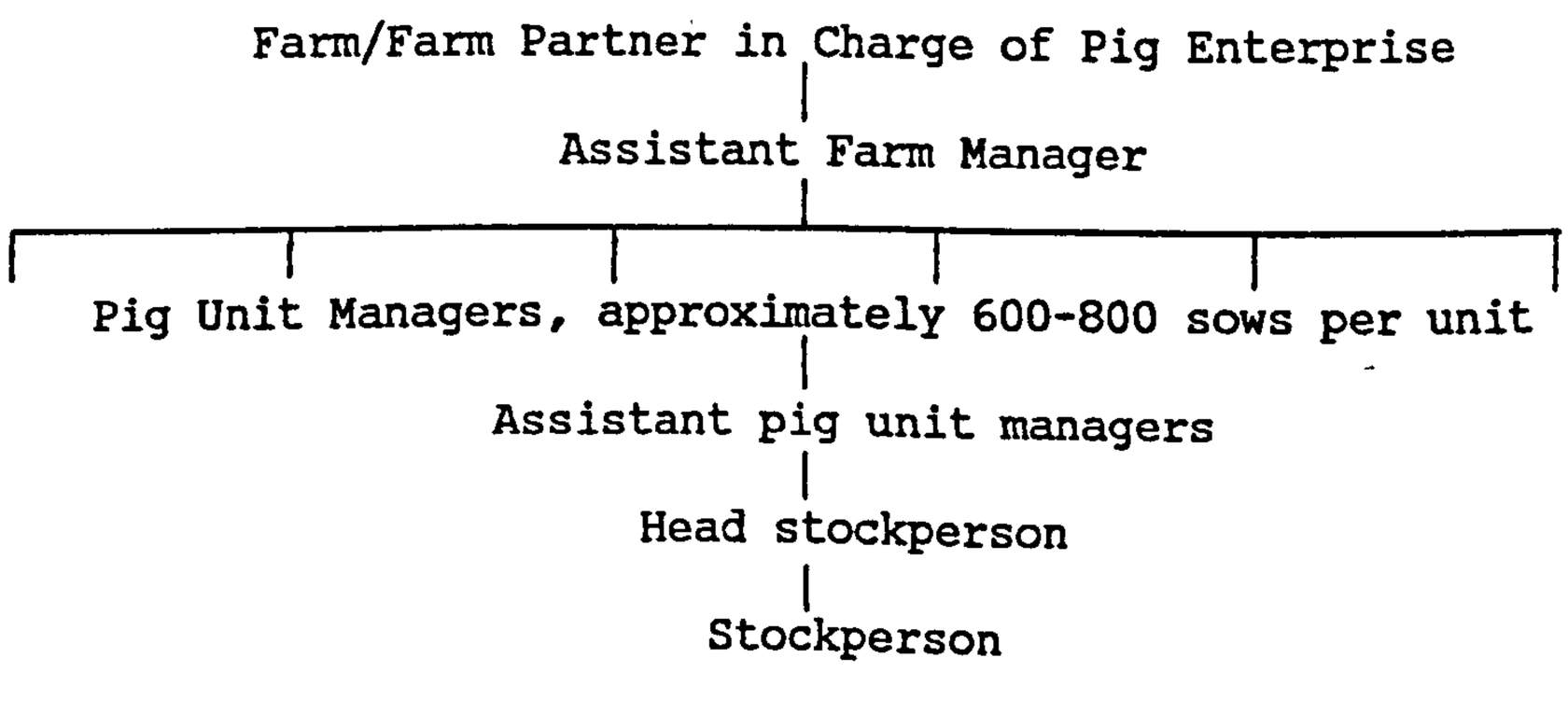
The course of training was successful and pursued into a second year. Despite some of the scepticism and the findings of the unit manager questionnaire, the selection of staff for courses remained the same. The researcher did self-administer and send out Then-now questionnaires to all the attenders for the 1988/89 and 1989/90 training years. These were mailed to the course tutor and handed out to the 1989/90 group in particular. The response rate was over 70% with some very useful data collected.

The researcher then turned to the "training system" used by the control group. This was to assess whether the training process used by the study group was effective when compared to the control group.

4.3.3. The Control Group of Experienced Pigpeople

A Control Group for this pig analysis was chosen on the basis of its lack of involvement in any ATB pig enterprise training, in Appendix I is the company philosophy on training. This Control Group assessment formed Stage VI in Figure 24 of the data collection process. The private company structure was similar to the studied group, Figure 22, and the range of staff employed bearing in mind age and experience was very comparable, Conner (1977) and Figure 25.

Figure 25. Management Structure for Pig Company Used as a "Control" for this Study



The questionnaires used for this group were the following, and were self-administered:

(i) visual-spatial ability assessment,

(ii) self-report assessment on knowledge, skills and attitudes.

The objective of this work would be to establish:

(i) the level of visual-spatial ability,

(ii) the level of knowledge in certain areas, relating to ATB subject days,

(iii) the self-rated level of skills in certain areas,

(iv) the assessment of any attitude levels.

The self-administered questionnaires gave 100% return but some questions were treated equally with a small range of scores for self-report items i.e. all at level 4 or 3½ on a scale of 5, "good" but not "very good/excellent".

Due to the confidential and research nature of the study, there were no objections to any questions. The data is discussed later and shows some interesting characteristics.

4.3.4. National Statistics And Other Survey Work

The national statistics were researched by the author and used as a further comparison to check on external validity. The Meat and Livestock Commission (MLC) and Cambridge University Pig Costings, Ridgeon (1985-90) produce statistics for pig units in their recording schemes and these were used as a basis for comparison. With this data and the "control" group data it was possible to establish the level of competence outside the population of course attenders and use it for comparative purposes.

There will also be reference to one other piece of survey work. This survey involved the rating of staff by management to indicate areas of training need in six large pig companies, Seabrook (1985). It also collected views on management and other topics from the pigpeople. This survey helped to support the study and the views held by the author concerning aspects of perceived training needs and requirements.

The effectiveness of the self-administered questionnaire to collect data is evident in the high response rate and the data analysis will determine its reliability and validity in this study. The question type and content caused few problems and the answers were factual and complete. Any mailed questionnaires required some prompting by telephone and in many cases it was time and not lack of intention that delayed the response. Once all the questionnaires were collected, then the data was collated and analysed and resulting trends shown in the next chapter.

The experimental design and use of questionnaires for data collection proved to be successful in achieving high response rates. The herd physical performance figures can undergo within the group analyses and group comparison with MLC statistics. The self-report ratings for any increases in levels of knowledge, skills and attitudes and possible links with improved unit performance can be analysed and assessed to lend support to the choice of criteria for evaluating the effectiveness of training for experienced agriculturalists.

CHAPTER 5

AN EVALUATION OF THE PARTICIPANT'S RESPONSES TO THE DATA COLLECTION TECHNIQUES (PART 1)

Completed questionnaires for each group of enterprise training were submitted according to the timetable scheduled in the methodology. The participants consisted of two pig enterprise groups with a control group for each enterprise. The results concentrated on changes in the perceived level of knowledge, skills and attitudes, possibly due to the training (self-report ratings were used). Some physical data for the pig units, on which the trainees worked, was collected and compared within the group and against National Statistics.

The results will be presented in the following sequence:

Pilot study of Pig-person Training 1986/87 - Section 5.1.

1. Pre-course Evaluation of Training Needs
2. Evaluation of the Training Days for the Pilot Study Group.

Main Study of Pig Unit Staff Training 1987/90 - Section 5.2.

1. The main characteristics of the participant pigpeople.
2. The analysis of the questionnaire for pig unit managers.
3. The analysis of pig herd physical data for each group of pig trainees and comparative national data.
4. The analysis of changes in knowledge data collected from each course group in the study.
5. The analysis of changes in skills data collected from each course group in the study.
6. The analysis of changes in attitude data collected from each course group in the study.
7. A comparison between the study group and the control group.

5.1. Pilot Study of Pigperson Training 1986/87

The evaluation followed the timetable, methodology and data collection procedures noted in Chapter 4, Figures 21, 23 and 24. A pilot study was pursued so that questionnaire designs and question content could be tested. Using this information, revised questionnaires were produced and distributed to the main study training group over the period 1987/1990. The various changes in level of knowledge, skills and attitudes for the trainees were noted, which led to further investigation in the areas of visual-spatial, psychological ability and the effect of working on large pig units, especially for large companies. The pilot study work commenced in 1986 and formed an ideal basis for the main study groups in 1987.

5.1.1. Pre-course Evaluation of Training Needs

Every member of the ATB Training Group in the Norwich area who owned a pig unit was sent a confidential questionnaire "Unlock Your Unit Performance - With Pig Production Enterprise Training" by the local Training Officer, copy in Appendix A. Ten farmers subsequently returned their answers and the resulting data was analysed to form the basis of a programme of training days, organised to meet the needs of the management assessment of individuals (only seven replies were usable).

Physical performance levels for each unit were entered in the first section of the evaluation questionnaire, and these are summarised in Table 2 for the course attenders.

Table 2. Review of Enterprise Targets

Efficiency Factor	MLC top $^1/_3$	Study Pig Units A	B	C	D	E	F	G
Pigs reared/ sow/year	23.7	19.6	23.5	20.0	24.8	20.5	20.2	22.7
Mortality	10.1	11.4	9.0	10.8	8.0	10.1	12.8	9.0

NB: Other efficiency factors were given but these related to management decision areas rather than stockperson decisions.

Ten units were contacted and seven sent back data that was complete enough to use in this study. Once they had established their targets, the course planner analysed the Strengths, Weaknesses, changes, Opportunities and Threats (SWOT analysis) for the business. This was not completed very satisfactorily by many of the participants in this study. The most important area of "training needs assessment" was completed as section 3 of the evaluation. Each unit recorded the key jobs and decision areas and assessed the ability of each member of staff including the farmer or unit manager, to complete these jobs. A total of twenty-three people were shown to have ability in many areas from "excellent performance" (score of 3) to "not to standard but needs the ability" (score of 1). There was a category for "new job to be done in future, due to change" (Score 0). The data was collected as a score for each job. This was totalled and averaged for the total respondents and summarised in Table 3.

Table 3. Key Jobs and Decision areas. (Scored 0 to 3 on the scale)

Key Job/Decision areas	Average level Score	Number people Assessed
Feeding levels	2	14
Weaning to service	1.5	3
Injection hygiene	1.5	2
Selection for grading	2	2
Disease recognition	1.7	7
Building maintenance	2	6
Machinery maintenance	1	2
Pig service management	2	13
Farrow house management	2.2	12
Weaner management	2	13
Time management	1.5	3
Record keeping	2	7
Rearing/fattening pigs	2.2	12
Feeding in lactation	3	3
Feeding in pregnancy	2.6	5
Culling	2.6	3
Mill and mixing	2.5	2

There were seventeen Key Jobs identified as important to the units and the main Jobs favoured by the largest number of units were those associated directly with pigs, i.e. farrowing, service management, weaner and finishing pig management mainly scored at "2+", Table 3. Feeding was also very important along with the record keeping which is vital in this type of intensive livestock production. The final area evaluated by the form involved the assessment of management skills and knowledge as opposed to the practical and knowledge based areas

associated with the pigpeople themselves. The researcher did not use this data as it is management rather than wholly stockperson orientated. The Key Jobs data highlighted areas of concern, e.g. injection hygiene, disease recognition and machinery maintenance. However when the individual's data was scrutinised the ability of the farmer was generally assessed at "good performance but needs to develop" whereas in many cases "sons" and "staff" were often scored "good, but could improve" and sometimes "not to standard, but needs the ability". Out of all this data a training plan was established which included the subject areas shown in Table 4 with the numbers of potential staff to attend against actual numbers attending.

Table 4. The Proposed Training Day Schedule

Activity	Numbers proposed to attend (needing training)	Numbers attending
1. Service management	10	7
2. Vet and hygiene	6	6
3. Records	3	6
4. Farrowing management	4	7
5. Pregnancy management	4	6
6. Reducing piglet mortality	4	4
7. Aiming at maximum conception	8	7
8. Buildings and maintenance	4	7

The local training group officer from the Agricultural Training Board agreed the programme and it proceeded to run in the Winter/Spring of 1986/87. The venue was a site in the centre of the region for the training group members.

5.1.2. Evaluation of the Training Days for the Pilot Study Group

There was only the ATB pre-course questionnaire on training needs used in the pilot study plus a fully researched Then-now questionnaire handed out at the end of each subject day. Seven students attended the enterprise training regularly and all agreed to complete the questionnaire in Appendix B often after telephone prompting. A further three who attended some days also completed the questionnaire. The general closed questions revealed some interesting background information which is summarised below.

(i) 65% of the participants have less than ten years experience,

(ii) the herd size tended to be between 70 and 150 sows,

(iii) 60% were aged 18-30 years,

(iv) 50% of group were farm workers and the rest farm owners,

(v) all the pig units showed improvements in the physical and financial performance in the range 0-10% and 0-20% respectively.

The participants were younger herdspersons with limited experience but a keenness to learn more about the latest advances in their enterprise.

The participants were also requested to self-report their levels of knowledge and skills in the subject areas covered on the training days, Appendix B for a copy of the questions. These sections covered the whole course of pig enterprise training and not subject days only. The resultant increase in average total scores for each subject area assessed, "a" to

"o", are shown in Figure 26. This Pre-then-now section gave some variable but interesting results.

Subject areas where little or no change was recorded,

(i) benefits of induced farrowings,

(n) recognise signs of oestrus.

Subject areas where a large increase was recorded,

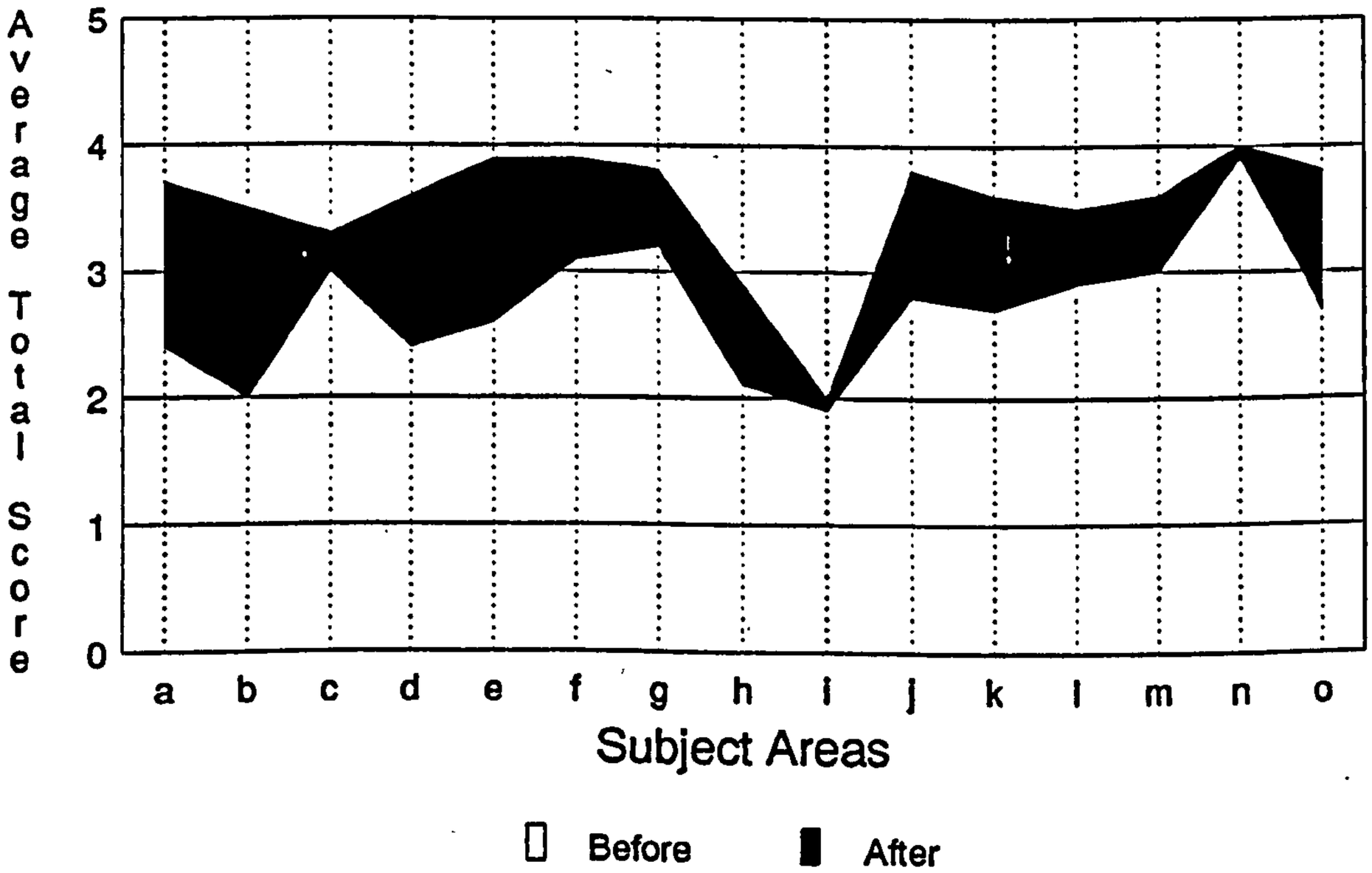
(a) Preparation of the sow before service,

(b) Managing services,

(e) Hygiene required at farrowing and

(j) Causes of piglet mortality.

Figure 26. Average Total Scores for Self-report Knowledge Levels in Subject Areas covered by Pig Training

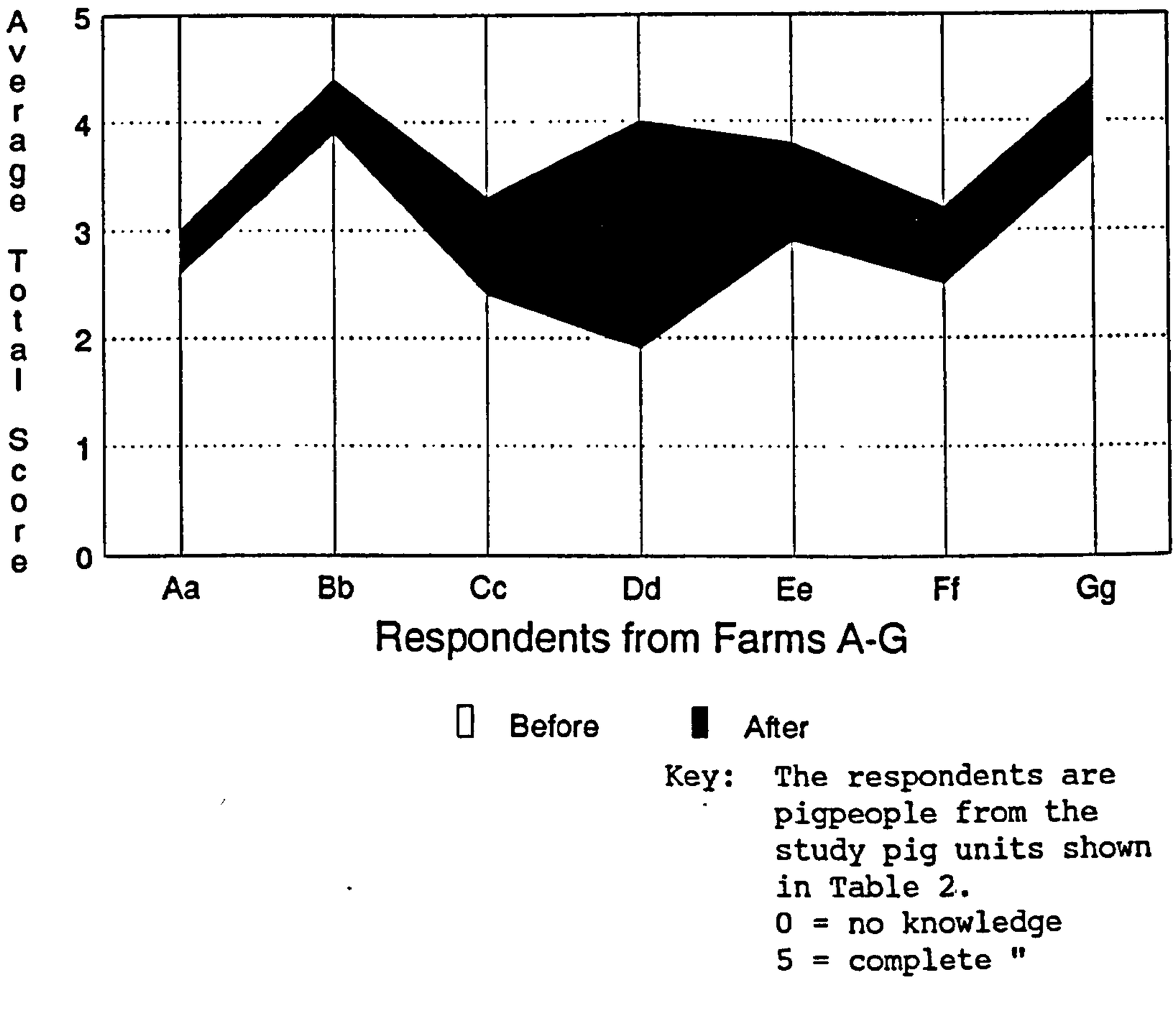


Key: 0 = no knowledge
5 = complete "
"a" to "o" listed on questionnaire
Appendix B

The self-report total score increases ranged from 4% to 75% over the training period bearing in mind the response shift

bias, 27% scored themselves less than half marks, before the course commenced.

Figure 27. Average Total Score - for each respondent - for Self-Report Knowledge Levels in Subject Areas covered by the Pig Training

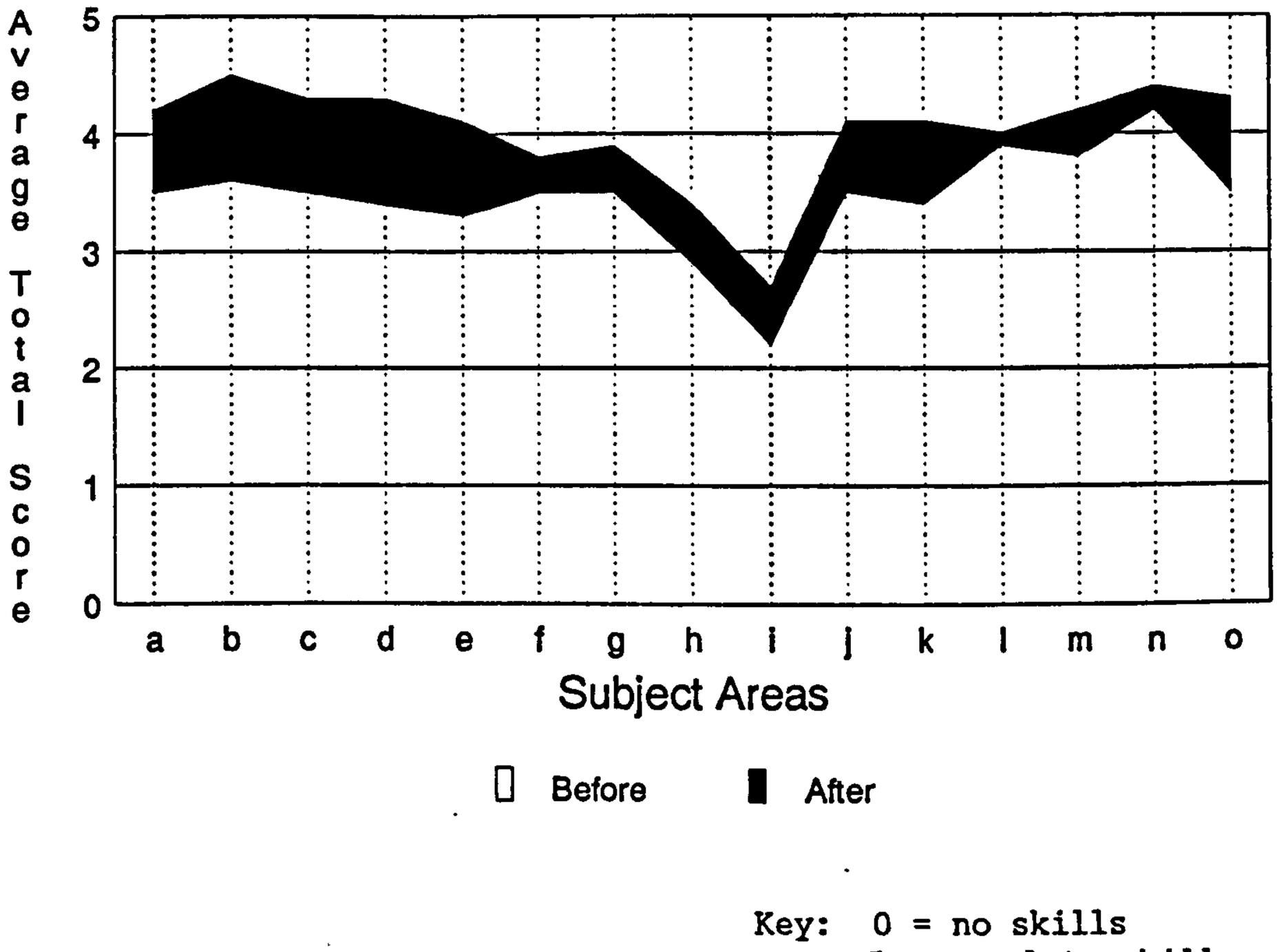


Key: The respondents are pigpeople from the study pig units shown in Table 2.
0 = no knowledge
5 = complete "

The above diagram, Figure 27, includes only the trainees who completed the whole range of fifteen subject areas (7 trainees out of 10). The zero score related to "no knowledge yet" and five related to "complete knowledge" on the rating scale. Respondent Dd reported a 2 point increase from a low level whereas Aa and Ff only recorded small improvements.

The pigpeople then went on to self-report their confidence in skills related to the subject areas (a - o). A similar trend is established to the knowledge scores with higher readings after the course but a smaller gain due to a higher starting base. (3.4 as opposed to 2.7), Figure 28.

Figure 28. Average Total Scores for Self-report Skills/ Confidence Levels in Subject Areas covered by Pig Training



Key: 0 = no skills
5 = complete skills
"a" to "o" listed on questionnaire in Appendix B

Subject areas where large increases in self-reported skills/confidence were recorded:

(a) Preparation of the sow before service,

(b) Managing services,

(c) Recognising diseases,

(d) Prevention of diseases,

(e) Hygiene needed at farrowing,

(j) Preventing starvation,

(k) Causes of piglet mortality.

The trainees recorded substantial increases in knowledge and skills in similar areas, Figures 26 and 28.

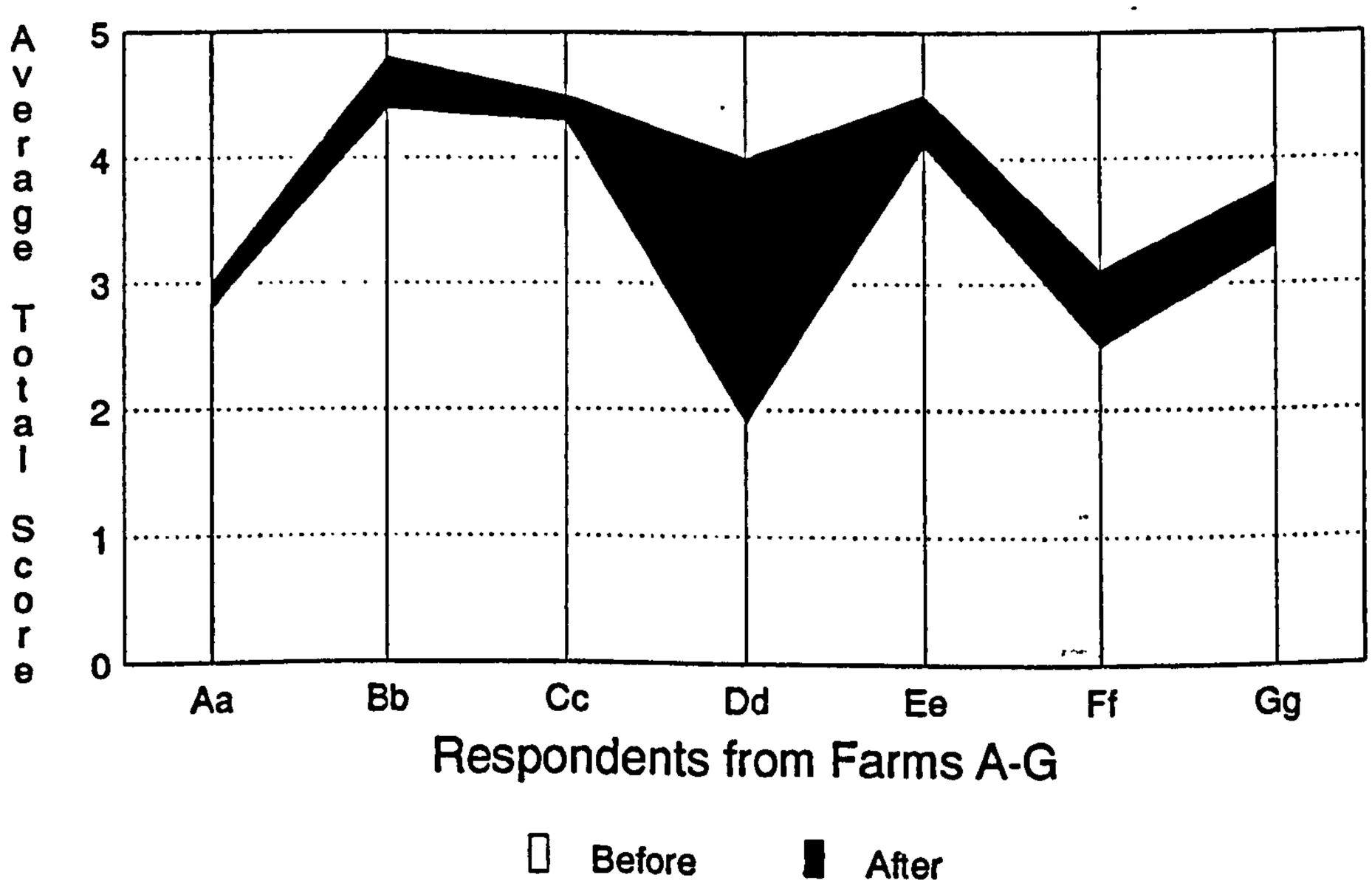
Some subject areas recorded low increases:

(i) Benefits of induced farrowings,

(l) Different ways to foster and wean.

Pigpeople did not seem to use "induced farrowing" to a great degree and so the skill level was low even after the sessions. Figure 29 shows that 3 pigpeople, from the study pig units, Aa, Dd and Ff gave themselves low assessments for the start of the sessions. After the training only Dd self-reported a large increase, i.e. a 2 point increase. Other pigpeople started at a high level of confidence and improved slightly.

Figure 29. Average Total Score - for each respondent - for Self-Report Skills Levels in Subject Areas covered by the Pig Training



Key: 0 = no skills
5 = complete skills
The respondents are pigpeople from the pig study units in Table 2

The pigpeople showed an ability to be able to assess their knowledge and confidence using a self-report rating scale. The increases in these ratings were then set against improvements in two performance indicators which are known to be important to the pig industry:

- Pigs reared per sow per year
- Feed cost per kg liveweight gain.

The latter is very much a management rather than stockperson decision (control) so piglet mortality was chosen instead of the feed cost factor.

The trainee results were shown as follows:

Table 5. Physical Pig Unit Results for the Pig Units, where the Trainees are Working, showing Increases and Decreases over the 9 month Training Period

	Study Pig Units								
	MLC top $^1/_3$	A	B	C	D	E	F	G	Av
Pigs reared/ sow/yr	+1%	+10%	0	+3%	+9%	1%	+2%	+3%	+4%
Piglet mortality	+2%	-2%	0	0	+1%	0	+3%	+2%	+1%

The percentage increase in pigs reared/sow/year and decrease in piglet mortality were better than the MLC top $^1/_3$ for both efficiency factors as shown in Table 5. Data on the factor "litters per sow per year" were not collected unfortunately. It is however ranked high on the importance list by the MLC and is included in the case study of the pig groups 1987-90.

The improvements in self-reported knowledge and skills and the the physical efficiency factors for each study pig unit may

suggest a significant correlation between these two factors due to the training. However there is variability within the group and when the Spearman Rank Correlation Coefficients were calculated, a low level of significance was recorded. There were no coefficients above "0.5". The 5% significance levels from Spearman Rank Correlation Coefficient Tables are "0.8". A positive coefficient shows an increase in knowledge, skills and unit physical performance. A trainee may indicate a high ranking positive change in knowledge for example with zero or even a negative change in unit physical performance. This may be due to the fact that he/she is not the only individual working on a pig unit and contributing to the efficiency factor.

The questionnaires were amended after comments from the trainees and due to the slightly different format of the training schedule - explained in more detail in the next section. The physical data collected would also take into account the "litters per sow per year". With the pilot scheme demonstrating some success, the researcher moved on to the next phase of the project.

5.2. The Main Study of Pig Unit Staff Training 1987-90

The pilot study pig training group did not meet again so a new pig group in the same region was chosen to continue the project.

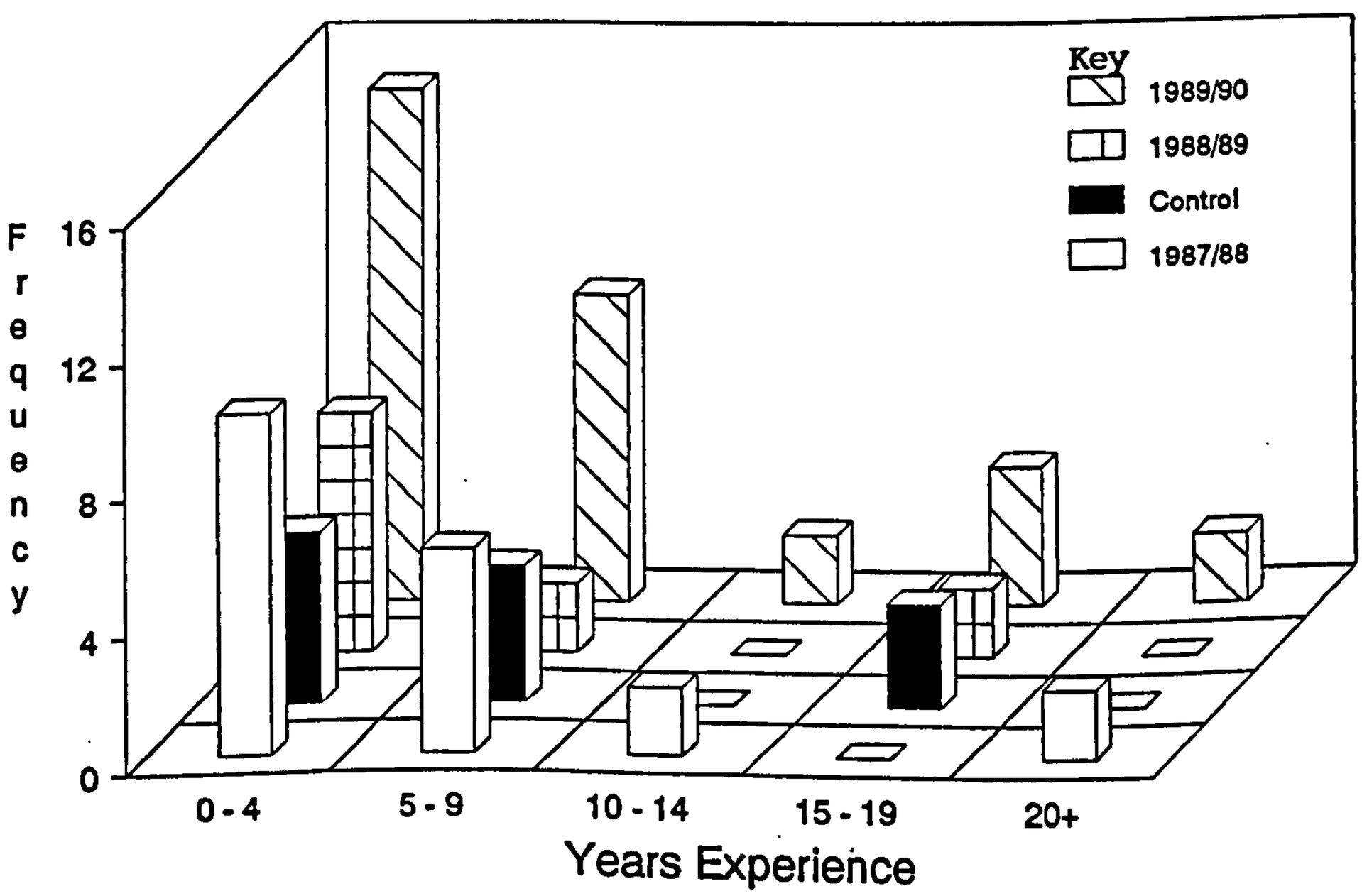
5.2.1. The Main Characteristics of the Participating Pigpeople

With a high response rate for the four groups of participants the researcher assessed the main characteristics of the trainees to provide background for the population. The response rates were 85%, 95%, 80% and 77% for the four groups: 1987/8 course; Control; 1988/9 course; 1989/90 course, respectively. This analysis provided some interesting features on the population of pigpeople which will be considered as the first section of data collected for each of the four groups.

(a) The Years of Experience on Pig Units

Just over 50% of the people participating in this study had less than five years experience. There was a high percentage of pigpeople with limited experience who were trainee stockpeople as shown in Figure 30.

Figure 30. Distribution of Years of Experience for Each Group

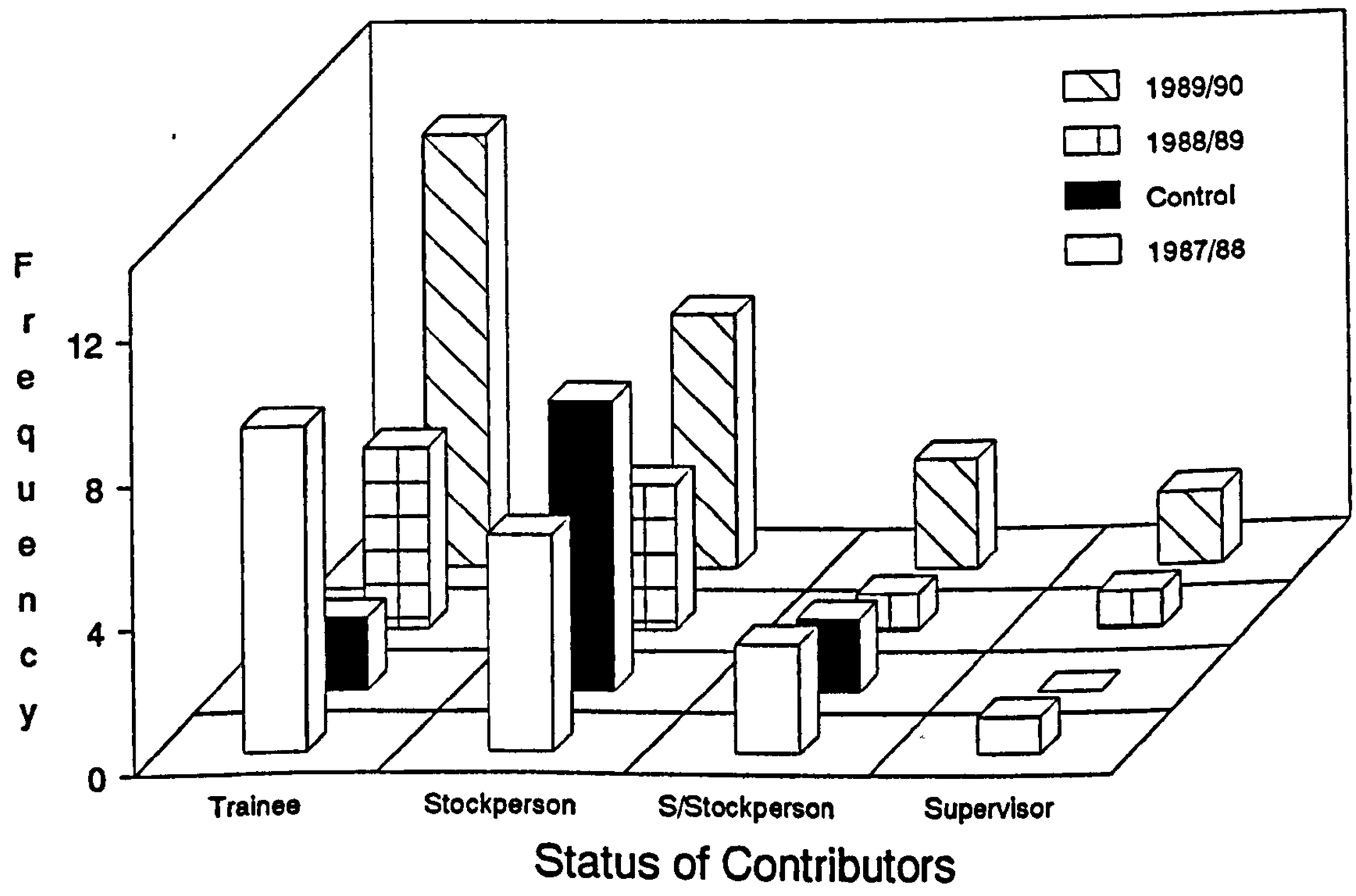


They were keen to do well and qualify, with proficiency tests in five main task areas, as stockpeople. There were also some very experienced stockpeople and perhaps they came or were sent to catch up on the latest advances and new ideas concerning housing, feeding, health and reproduction.

(b) Pig Unit Status of the Contributors to this Study:

The statistics, in Figure 31, show that 49% of the participants were trainees as one would expect, with some senior stockpeople and supervisors returning for updating in certain areas that have a large impact upon physical and financial performance.

Figure 31. The Status of Contributors to this Study



Very few of the attenders had any other formal qualifications other than those which accrue from attendance on ATB courses. (There were two trainees with National Diploma in Agriculture and three National Certificate students).

5.2.2. The Analysis of the Questionnaire for Unit Managers

This questionnaire formed Stage III of data collection, Figure 24, and established many Management practices. There was no formal needs/skills analysis carried out by the unit managers who send staff on Pig Training. Therefore the researcher set out to establish the basis upon which selection was taking place and the process of staff evaluation as their development continued. The full questionnaire is set out in Appendix C and shows the following features on analysis.

(i) Trainees were selected by the unit manager when they do not appear to be doing a good job or by "gut reaction" on training needs, i.e. no formal selection process. One manager said that he "looked at the records and when they appear to be weak, he put them in for training".

(ii) Training should be concentrated, based on the units and totally relevant - skills and knowledge based. One manager stated that "success centres on the tutor and more one to one training is required".

(iii) There were no formal report back sessions apart from an informal comment. The questions usually asked were "Was it worthwhile attending? Did you learn anything?"

(iv) An evaluation questionnaire on the course should be a normal part of the procedure and possibly skills testing, every manager agreed on this point.

(v) All the unit managers had a positive attitude to training but demanded value for money due to the extra workload for the remaining staff when a trainee is away. "The training must be good. We ought to have our own apprenticeship scheme", commented one manager.

(vi) All unit managers had meetings with all their staff either on a monthly or fortnightly basis to discuss the unit performance figures and so communicate successes and failures. "The figures from the main office are OK but they need translating into action" was one comment.

(vii) The staff have mixed ability, but the main requirement is a "feeling for livestock".

There is a standard training course for all new entrants to the pig companies studied in this research work. This continues right up to the ATB management series of training available for supervisors and unit managers. Enterprise training would normally start with a "needs" analysis whereas selection is based on subjective assessments of their staff for training and staff development. The main reason forwarded for not following an established practice of selection and follow-up was "no time to do it and do it properly".

5.2.3. The Analysis of Pig Herd Physical Data for Each Group of Pig Trainees and Comparative National Data

The pig unit physical and financial performance data for trainees involved in them was collected from the general managers of the pig companies as part of Stage III of the data collection process, Figure 24. There are many efficiency factors that reflect the physical performance of the pig unit, Pig Vet Society (1987). The number of piglets reared per sow

per year, along with piglet mortality, will reflect the level of "stockpersonship" and the dietary control of sows and weaners at the early stages of life. The litters per sow per year figure concentrates on the breeding cycle and the level of "stockpersonship" to maximise conception and increase the potential viable output. These figures may reflect good or poor housing conditions and quality of stock being finished which is beyond the control of the stockperson being trained.

The stockpeople would regard the first factor "piglets reared per litter" as a reflection of the "stockpersonship" and the sow potential for producing and rearing piglets. Piglets born per litter shows the genetic potential of the sows and the boars plus correct feeding at this stage. Piglets born alive per litter will also reflect "stockpersonship", housing and correct feeding.

The "stockpersonship" of every member of the pig unit will be reflected in the level of pigs reared on the unit unless there are factors beyond his control which may influence these figures. Unit data is shown in detail in Appendix B and the progress of certain stock units has been recorded in Table 4. It is difficult to separate successful individuals and their impact upon their units without an established feed-back system used by the unit managers.

The physical data is reviewed, but not statistically analysed due to the small sample involved.

(a) **Pigs Reared per Litter**

Data was collected from the unit managers and from the end of year comparative standards and shown in Table 4. - A complete set of raw data is shown in Appendix D.

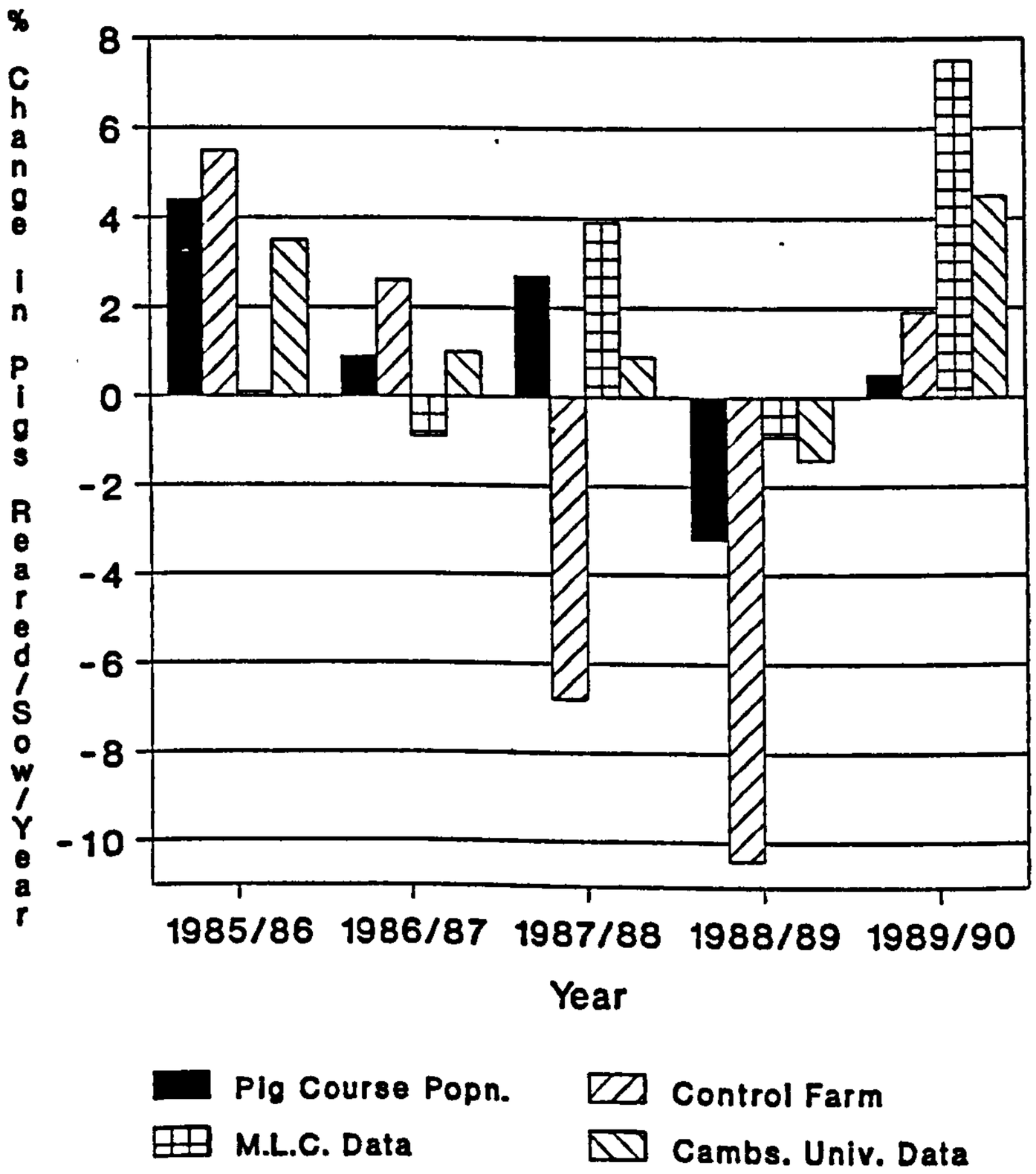
Table 6. The Means of Pigs Reared per Sow per Year Data Collected from the Total of Pig Courses Population and the Comparative Costings Schemes

Source	Pigs Reared per Sow per Year					
	1985	1986	1987	1988	1989	1990
Total of Pig courses population	20.5	21.4	21.6	22.2	21.4	21.5
Control Farm	19.4	20.3	20.8	19.3	17.2	18.5
MLC Data (1985-1990) (herds > 500 sows)	21.2	21.2	21.0	22.0	21.8	22.0
Cambridge Univ. Pig Costings(top 25%)	20.7	22.3	22.1	22.8	23.1	23.3
(average) (Ridgeon 1985-1990)	20.1	20.8	21.0	21.2	20.9	21.0

The number of piglets reared per sow per year increased over the four year period 1985-1988 for the people who were trained on the first course in 1987/88, Table 6. The general trend, as shown in the data for a whole range of units, was upwards but at a slower rate than that shown for the study group up to 1988, Figure 32. There was a drop in 1989 due to problems on several of the units making up the study farm. The first group of trainees 1987/88 from the large company succeeded in achieving an increase of 2.7% compared to a decrease of 8.7% for the control group, over the period 1987 to 1988, Figure 32. They were also able to manage better results than one of the two National Survey statistics. The study farm results have followed the comparative figure trends throughout including the disappointing 1989 and start of 1990 figures. The 1988/89 and 1989/90 training groups would appear to have been unable to

equal the performance of the National Survey contributors. This may infer that the training has not been effective in increasing performance or that they as individuals were unable to influence the team work with their own unit. However the overall improvement of 5% over 5 years is very good with large herds already achieving reasonable levels of performance at the outset, Table 6.

Figure 32. % Change in Pigs Reared/sow/year for the Total Pig Courses Population and Comparative Data.



(b) Percentage Pig Mortality

The level of mortality is an important factor affecting the efficiency of a pig unit. Data is usually collected from the three recorded sections within any pig enterprise, i.e. breeding, rearing and feeding units.

Table 7. The Means of Pig Mortality Data collected from the Total of Pig Courses Population and the Comparative Costings Schemes (Total Mortality)

Source	1985	1986	1987	1988	1989	1990
Total of Pig courses population results	13.4	13.2	12.6	12.5	13.7	14.3
Control Farm	15.9	14.1	15.8	14.5	15.7	16.0
MLC Data (herds > 500 sows)	12.5	13.3	13.1	12.9	13.0	12.6
Cambridge Univ. Pig Costings	13.6	14.2	13.2	13.5	13.1	13.8

Table 8. The Means of Pig Mortality in the Breeding Unit from Total of Pig Courses Population and Comparative Costing Schemes

	1985	1986	1987	1988	1989	1990
Total of Pig courses population results	10.1	9.5	9.0	8.9	9.6	9.3
Control Farm	11.7	12.3	12.4	13.1	13.6	12.8
MLC Data (herds > 500 sows)	10.3	9.6	10.2	9.9	10.7	10.3
Cambridge Univ. Pig Costings	10.5	10.6	10.4	10.6	10.8	10.5

The level of total mortality for the pig units of the population attending the training fell over the four year period 1985-88 in line with the control farm and national statistics, Table 7. The final two years saw a sharp increase in mortality which took the level to a figure that was 6.7%

higher than in 1985. This trend was not repeated for the other sources of data to such a high degree, as shown in Figure 33.

Figure 33. % Change in Total Piglet Mortality for the Total Pig Course Population and Comparative Data

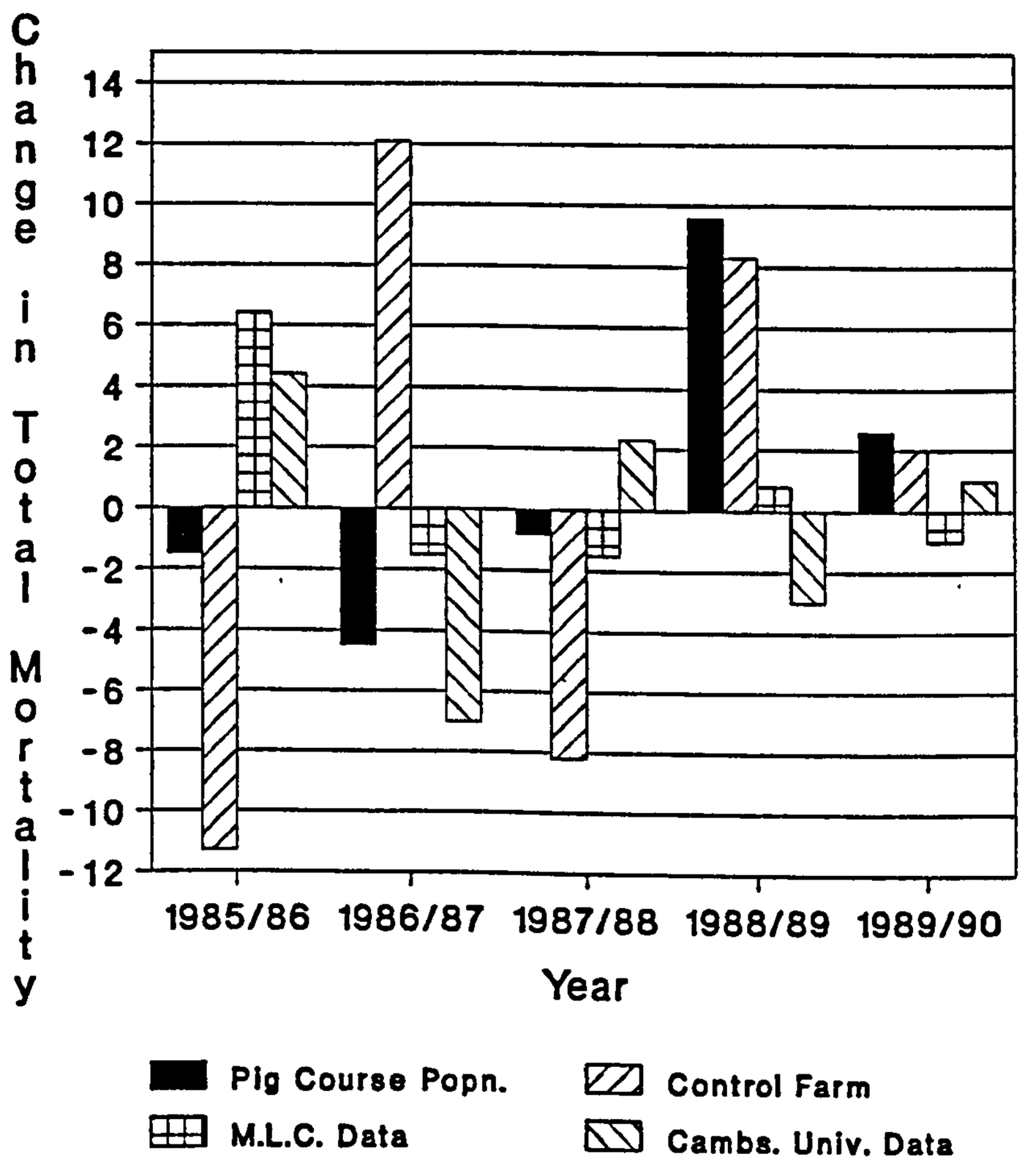
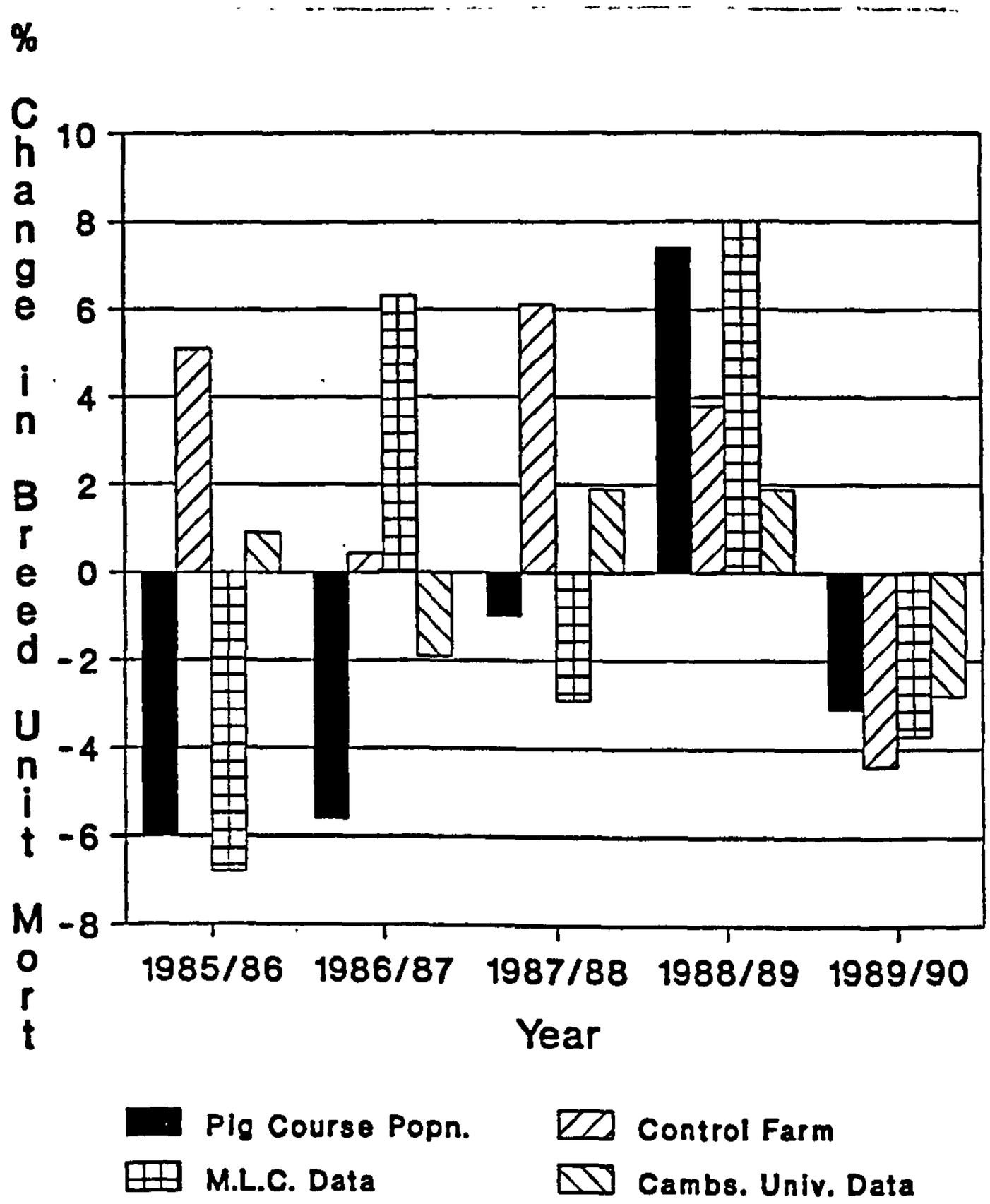


Figure 34. % Change in Breeding Unit Mortality for the Total Pig Course Population and Comparative Data



The breeding unit mortality figures show that the study group have improved by 8% over the five years and have managed to do much better than the nationally recorded pig units, Figure 34 and Table 8. The starting points for all four sources of data were similar but the end point after four years showed a 12% advantage to the course attenders for the breeding unit mortality and a 8% disadvantage for total mortality. The training would appear to be applied in the breeding unit with greater impact than the finishing units. The trainees in the breeding unit are often the sole employees and so they can readily affect unit physical performance.

(c) **Litters per sow per year**

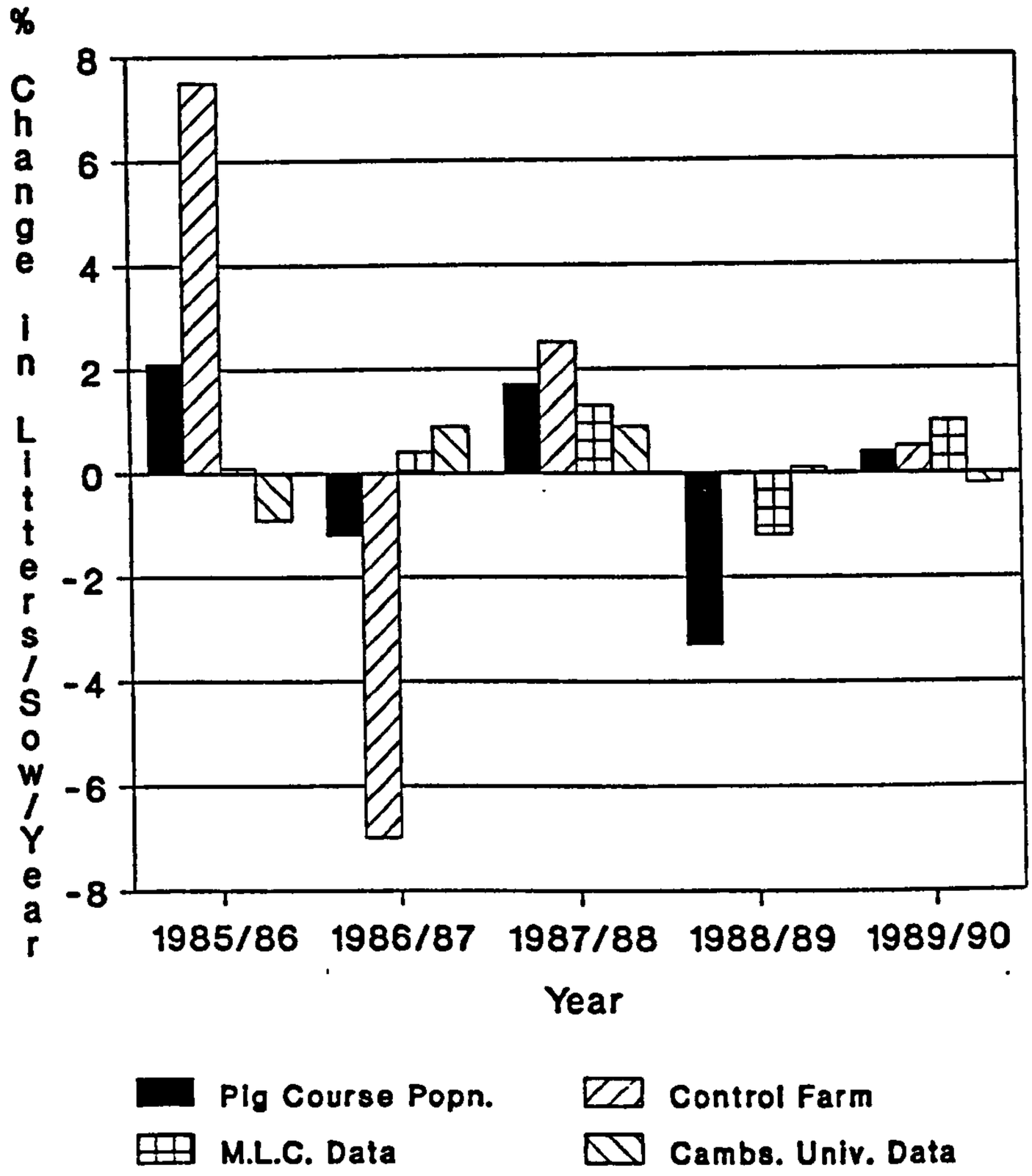
The number of litters per sow per year depends upon the farrowing index and is very much a factor within the influence of stockpeople. The feeding regime and the boar effectiveness are contributory factors towards a high level of performance. The data collected from the breeding pig enterprise is compared for the groups under discussion in this study in Table 9.

Table 9. The Means of Litters per sow per year Data from the Total of Pig Courses Population and Comparative Costing Schemes.

	1985	1986	1987	1988	1989	1990
Total of Pig courses population results	2.38	2.43	2.40	2.44	2.36	2.37
Control Farm	2.00	2.15	2.00	2.10	2.05	2.10
MLC (herds > 500 sows)	2.28	2.28	2.29	2.32	2.29	2.30
Cambridge Univ. Pig Costings	2.23	2.21	2.23	2.25	2.25	2.33

The changes that have occurred over the 4 year period from 1985-88 in the levels of litters per sow per year show that there has been a small increase for nationally recorded herds. The study group was on target for a higher improvement but the 1989 and 1990 figures succeeded in reducing the change to a negative effect rather than a positive effect, Figure 35.

Figure 35. % Change in Litters/Sow/Year for the Total Pig Courses Population and Comparative Data



The three efficiency factors discussed so far are used in the pig industry to assess the physical performance of the pig units. Progress in improving these factors could depend on the training courses and so the improvement in the knowledge, skills and attitudes of the trainees must be assessed.

5.2.4. The Analysis of Changes in Knowledge Data Collected from Each Course Group in the Study

There were nineteen, twelve and thirty-one members of staff from the pig company who contributed to the data collected on the 1987/88, 1988/89 and 1989/90 courses and they represented all the separate pig units within the company. They were asked to complete a questionnaire at the end of each subject day session. The 1987/88 participants were asked to complete a

Pretest at the start of the session. These were constructed as short answer questions to test knowledge and scaled scores to assess confidence in skills and attitudinal changes. The number of different subject days offered to the units were 8, 5 and 5 for the three years of training assessed by the researcher. The format of sessions in 1987/88 and 1988/89 were similar, i.e. staff from different units attended the subject days as off-the-job training days. Whereas in 1989/90, after consultation with the researcher acting as adviser, the format changed slightly to subject days offered to separate pig units and held on the units to give an opportunity for indoor (in a classroom) and outdoor (on a pig unit) activities to take place.

The assessment strategy required the attender to self-evaluate improvements in knowledge, skills and attitudes "before" and "after the course" once the single subject day course had been completed (Then-now). The percentage questionnaire return rate was 85%, 80% and 77%, for the 3 years studied and shown in Figure 21, and not 100% due to some attenders being unable to remain after the course and complete the forms. The researcher was unable to attend all the sessions and relied heavily upon a very cooperative and diligent tutor. The 1987/88 course were given a Pretest as well as a Then-now questionnaire. An average score for increases in knowledge, confidence (attitude) and skill have been calculated for the attenders on the subject days. There was some variation within the group which will be noted. The subject days were considered in the order:

Figure 36. The Order of Subject Area Days Given to the 1987/88 Pig Course

1.	Basic Pig Health	October 1987
2.	Condition Scoring	November 1987
3.	Infertility in Pigs	November 1987
4.	Boar care and effective service	December 1987
5.	Aiming at maximum conception	January 1988
6.	Practical gilt selection	February 1988
7.	Disease control and prevention	March 1988
8.	Reducing piglet mortality	May 1988

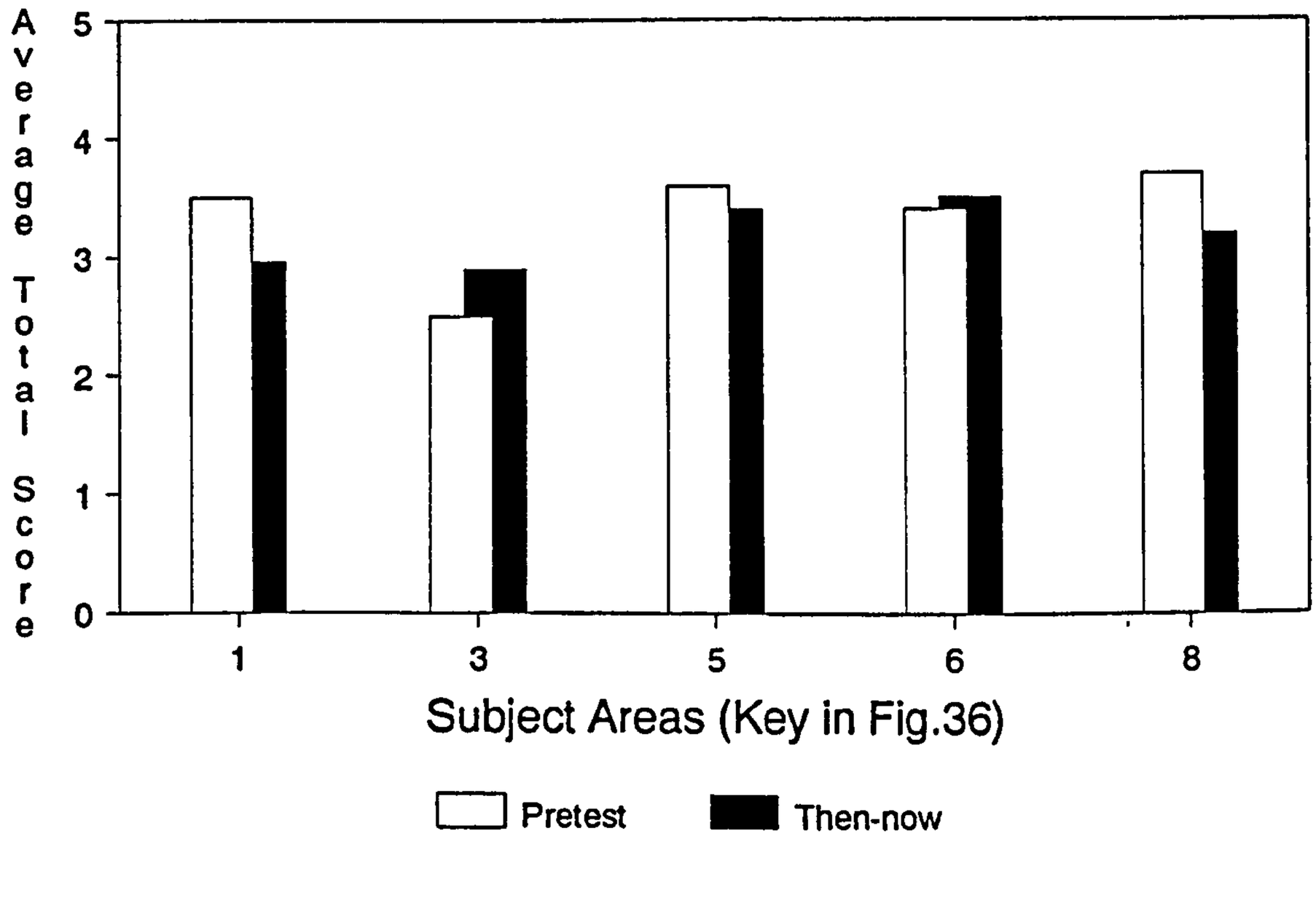
There were three programmes of participants who were assessed on the training sessions from 1987 to 1990. The control group consisted of employees from similar size pig units where no training schedules exist other than knowledge and skills passed on by the manager and experienced staff to the new staff - often relief workers until a permanent post on the unit becomes available. The percentage increases in knowledge, perceived to be due to the training, are considered first with a look at the Pretest to Then-now comparisons and the Pre-then-now analysis.

Five out of the eight subject days on the 1987/88 course were given a short Pretest at the start of each session. There were two occasions when the researcher was unable to attend the subject day training and the course tutor was unwilling to run the Pretest. The other time when no Pretest was carried out occurred when the trainees did not turn up until late and the course tutor could not afford any further delay. The research work by Ralph (1975) and Howard et al (1978) suggests that the Pre-then-now score of initial knowledge, skills and attitude

levels assessed after the course is more realistic than the traditional Pretest and Post-test as discussed in Chapter 3. However, it was decided to test this theory upon mature agriculturalists being trained over a period of time. The researcher and tutor handed out a Pretest questionnaire which asked a series of short knowledge questions and then a set of confidence and self-reported levels of knowledge, skills and attitudes in some cases in the form of rating scales.

The results were calculated and compared with the Then-now scores of the tutee's assessment of his/her Pretest level, "before" the course started, having completed the training day, and "after" the course. Figure 37 shows the comparison for the five days tested and records on some days a lower Pretest score on two days and on others it is slightly higher. The lower Then-now score may indicate that the tutees are confident at the start of the day that they have high levels of knowledge and skill but after the training session realise that there was a "lot that they did not know and had not been told". A higher Then-now score may indicate that a tutee is lacking in confidence or perceives that they "do not know very much and are not very skilled and so they have been sent on a course". The session may boost their confidence due to the higher levels of inherent knowledge and skills that they recognise is in their possession.

Figure 37. Pretest Levels of Knowledge Compared with the Then-now Assessments of Knowledge "after" the 1987/88 Course Finished



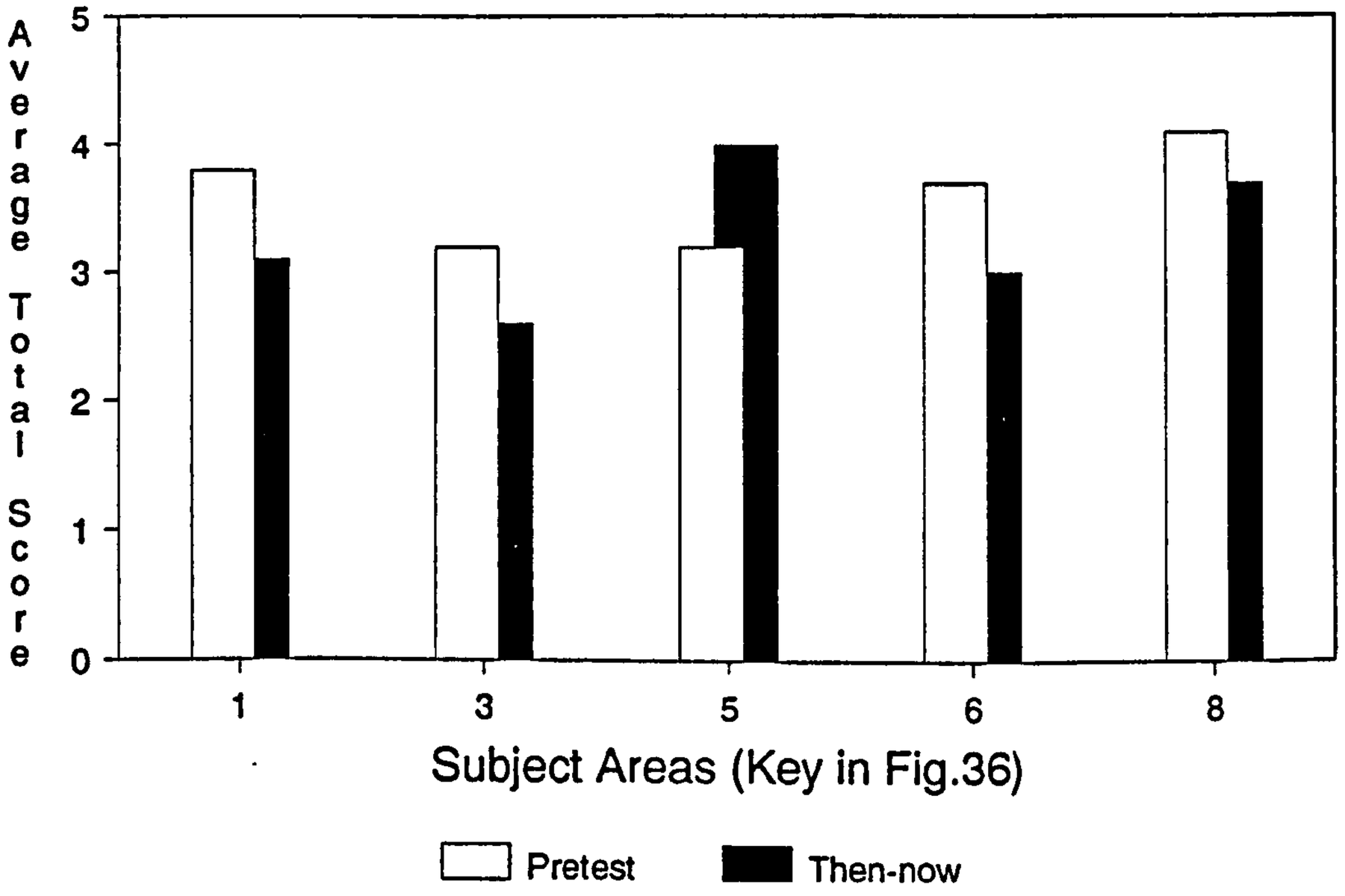
One trainee commented upon the Basic Pig Health course - "I thought that the manager had told me all I needed to know until the tutor started to tell us things that were totally new to me".

Another trainee commenting upon the Infertility in Pigs course, subject area numbers from Figure 36, "I was a little nervous about scoring myself very high on that first test but by the end of the course I realised that my knowledge was actually quite good".

The comments above convey the diversity of opinions with regard to self-reporting which may be a result of lack of clear career development within the pig unit staff structures. The Pretest also gave some indication of the skills levels that the

course attenders either self-reported or were shown demonstrated to have achieved, Figure 37.

Figure 38. Pretest Levels of Skills Compared with the Then-now Assessments of Skills "after" the 1987/88 Course Finished



Higher levels were recorded for the Pretest, in 4 out of 5 subject areas, and so one looked for comments from trainees to give some indication of reasons for this phenomena.

One very experienced pigperson commented, "I thought it was easy to do because the manager had shown me many years ago. When the tutor pointed out further reasons for choosing or leaving gilts I realised that I only knew half the story". This was a comment on the subject area number 6; Practical Gilt Selection.

A dry sow unit stockperson said, "I do the best that I can for the sows and the boar but I always thought there was a lot

wrong. However, by the end of the day at the Lodge, I feel sure that my skills are adequate and maybe there are other reasons for not achieving a maximum. A good day's training". This was a comment on the subject area number 5; Aiming at Maximum Conception.

The Pretest data is interesting and will be discussed fully in the next chapter. This analysis tends to support the work of Ralph (1975) and Mezoff (1981), Figure 39.

They observed that Pretest scores in a Pretest, Post-test design when compared to Post-test scores gave low percentage increases. When the trainee was asked to assess their level "before" the training commenced, having now attended the course, the score "before" the course was lower and so the percentage increase was higher. The scores and comments from the adult, experienced agriculturalists would tend to support the value of Then-now evaluative studies. They also form the basis for developing a technique that is easy and quick to use at the end of a training day and may give valuable course evaluation.

Figure 39. Comparison of Pre-Post Results with Pre-then-now Results

Figure 3.
COMPARISON OF PRE-POST RESULTS WITH PRE-THEN-POST RESULTS

Item	Pre-Post Results (Scale from 0-to-10) Pretest	Post test	Pre-Post % increase
Listening Skills	5.69	7.62	34.0*
Knowledge of Self	7.00	7.84	12.0
Perceptiveness of Others	6.31	7.31	16.0
Ability to Interpret Non-Verbal Communication	5.92	7.15	21.0

Item	THEN-POST Results (Scale from 0-to-10) PRE	THEN	POST (NOW)	(THEN - NOW) THEN-POST % increase
Listening Skills	5.69	5.38	7.62	41.0*
Knowledge of Self	7.00	5.62	7.84	40.0*
Perceptiveness of Others	6.31	5.42	7.31	35.0*
Ability to Interpret Non-Verbal Communication	5.92	4.69	7.15	52.0*

*Statistically significant at $p < .05$ level.

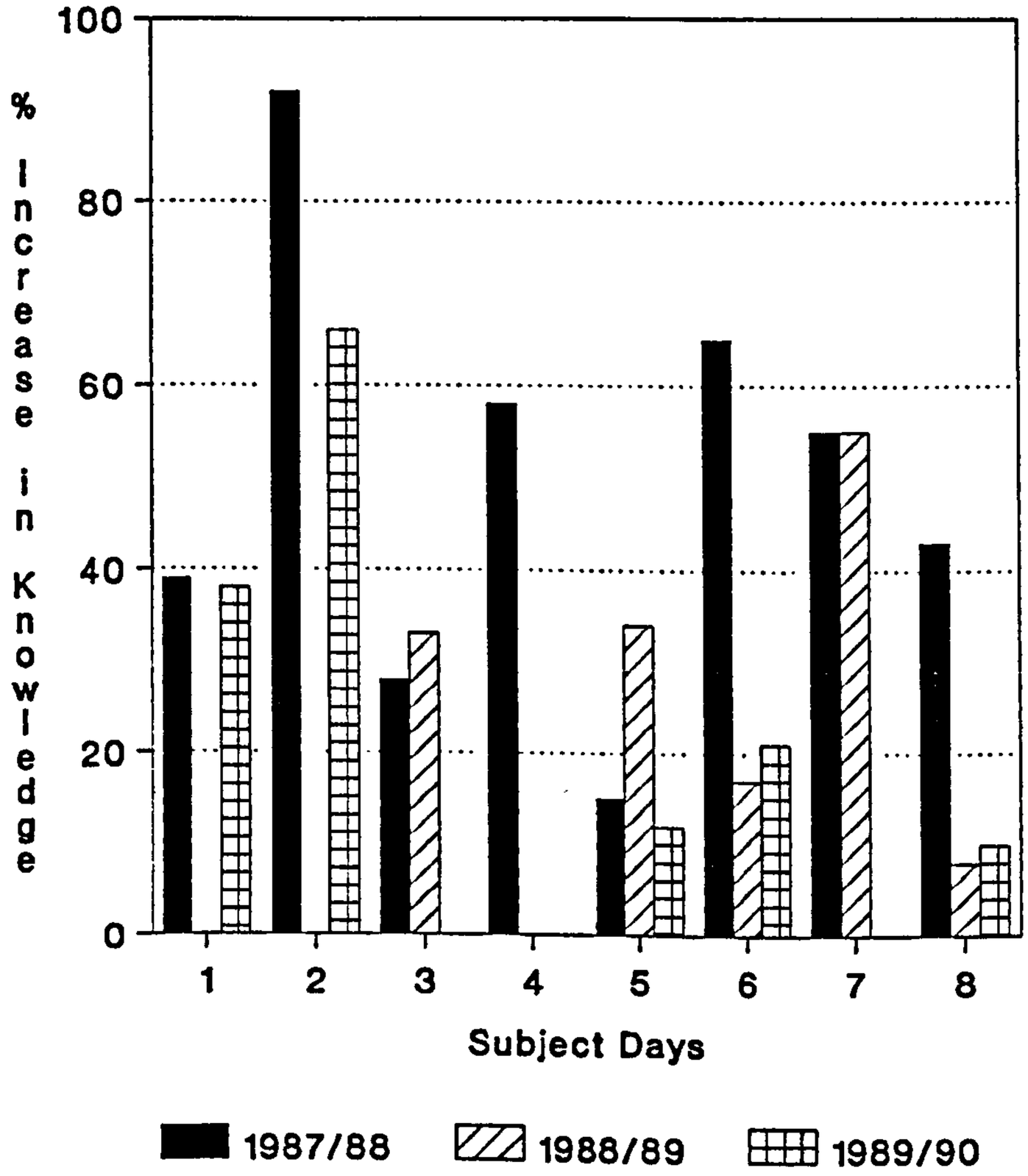
Source: Mezoff (1981)

With the Pre-then-now analysis supporting the comparative work by Mezoff (1981, the 1987/88, 1988/89 and 1989/90 were all given Then-now questionnaires to collect the data for this study. The level of knowledge was evaluated by using subject-based direct questions within the subject-day questionnaire and self-assessment questions on wider areas of knowledge that still come within the content for that day, Chapter 4 and Appendix E.

The course attenders were requested to self-assess their levels of knowledge "before" and "after" the course at the end of each subject day (Then-now). The "before" assessment at this stage should give a more realistic value as the participant will have a full knowledge of the depth and breadth of the subject area at the end of the day rather than a preconceived notion of its

notion of its level "before" the course has commenced. The 1987/88 course completed a Pre-then-now questionnaire sequence as explained earlier in this section 5.2.3. There were also some factual (direct recall) questions to be answered.

Figure 40. The Average Percentage Increase in Knowledge for the three Groups of Attenders



The data, collected by using a Then-now questionnaire design in Figure 40 shows the level of increases in knowledge for the three pig courses on a range of eight subject days. Not all of the different years were offered all the subject days due to the pig Company's Policy of concentrating on certain subjects for the 1988/89 and 1989/90 programmes. There was quite a variation between the increases recorded for different courses and for different subject days. Subject day two - Condition Scoring of Pigs - showed the highest levels of increased

knowledge which may be due to the introduction of staff to this new technique. Subject days five and eight recorded low increases in knowledge. Aiming at Maximum Conception, subject, day 5, and Reducing Piglet Mortality, subject day 8, are areas of constant concern on pig units and a high degree of knowledge in these subject areas is needed to achieve any success in the practical situation.

These average percentage increases may conceal the range of self-assessments attributable to the range of ages, experience and abilities of the participants, Figure 41.

Figure 41. Range of % Increases of Knowledge for each Subject Day for the 1987/88 Training Course Group.

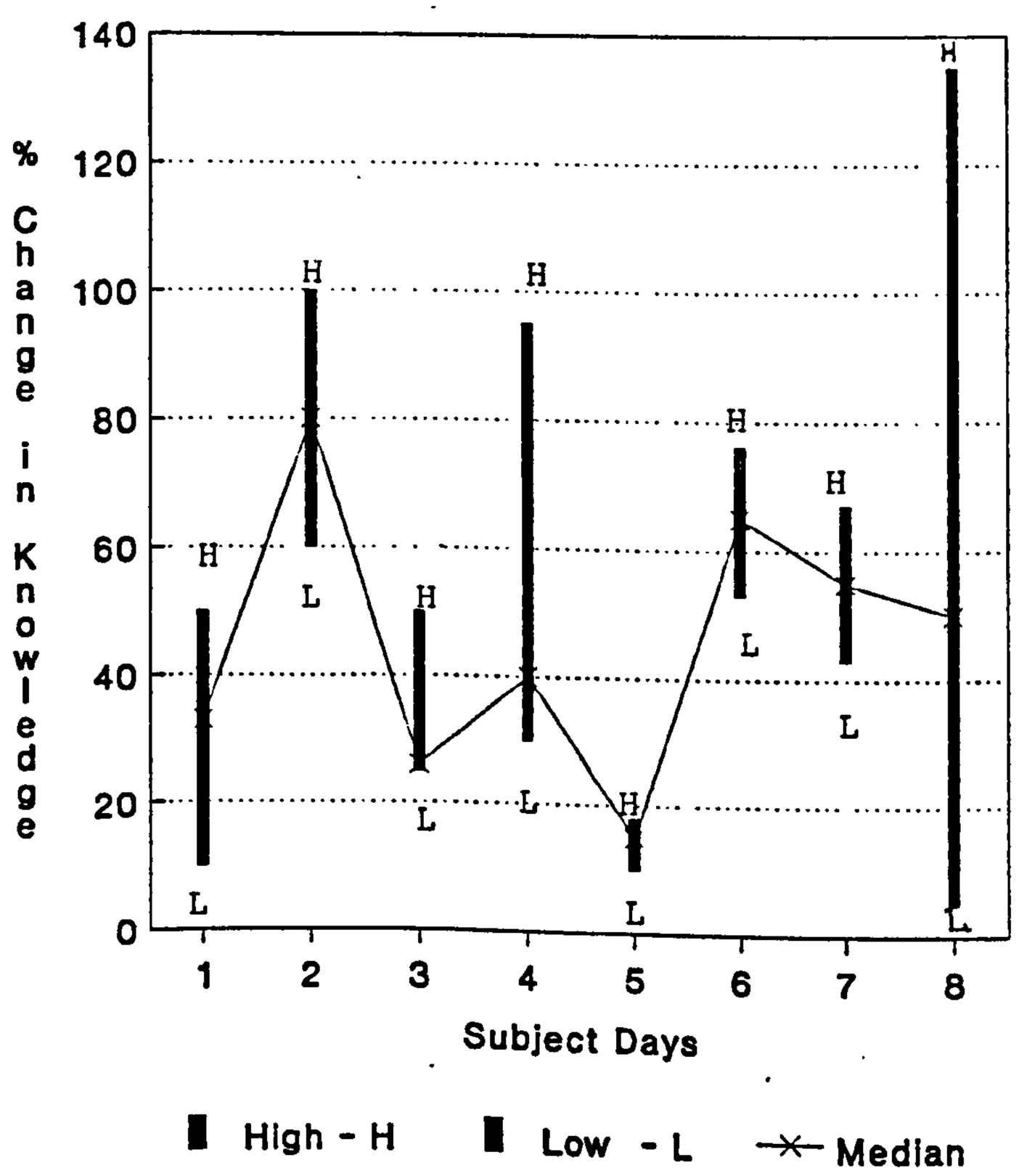


Figure 42. Range of % Increases of Knowledge for Each Subject Day for the 1988/89 Training Course Group

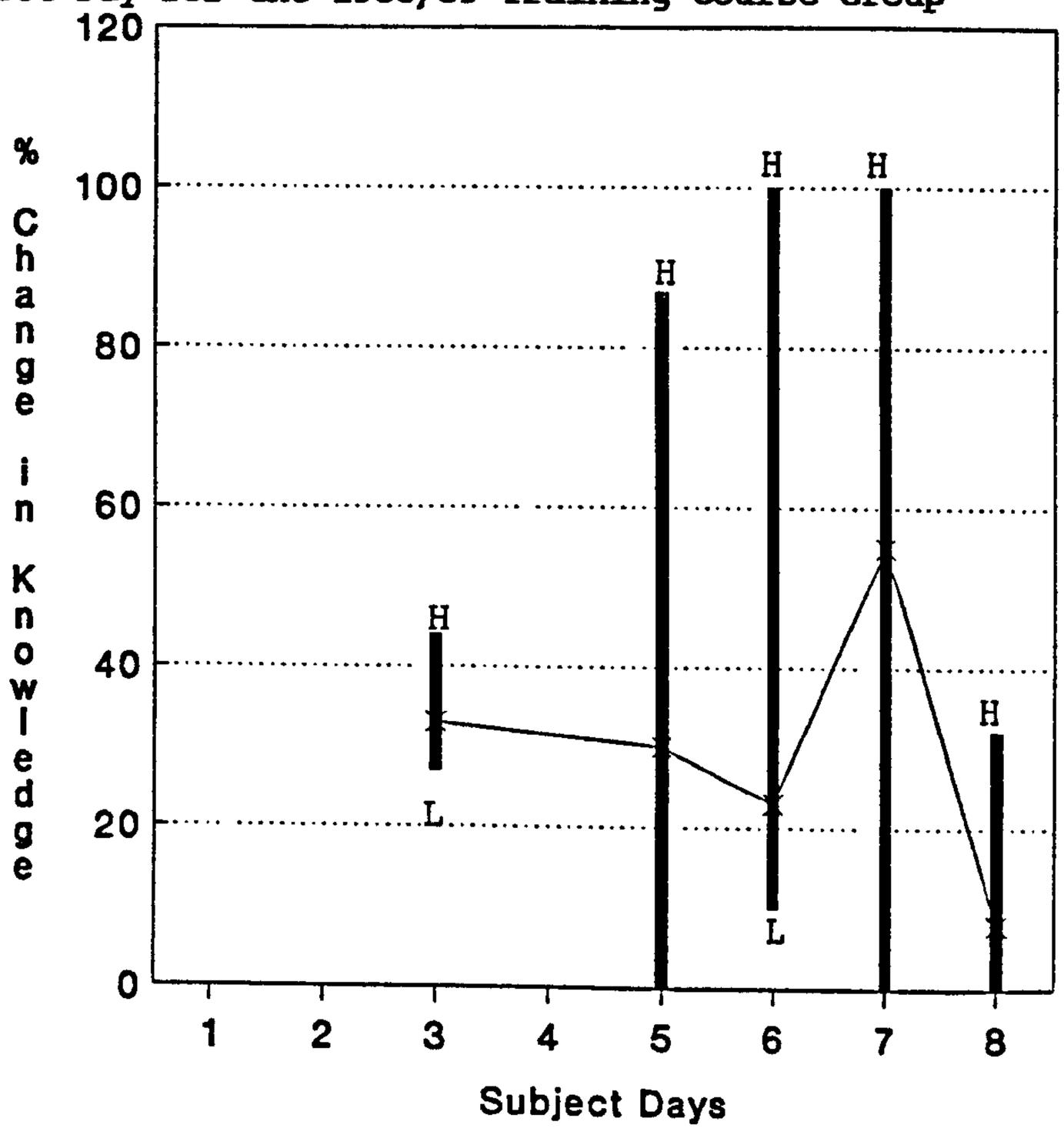


Figure 43. Range of % Increases of Knowledge for Each Subject Day for the 1989/90 Training Course Group

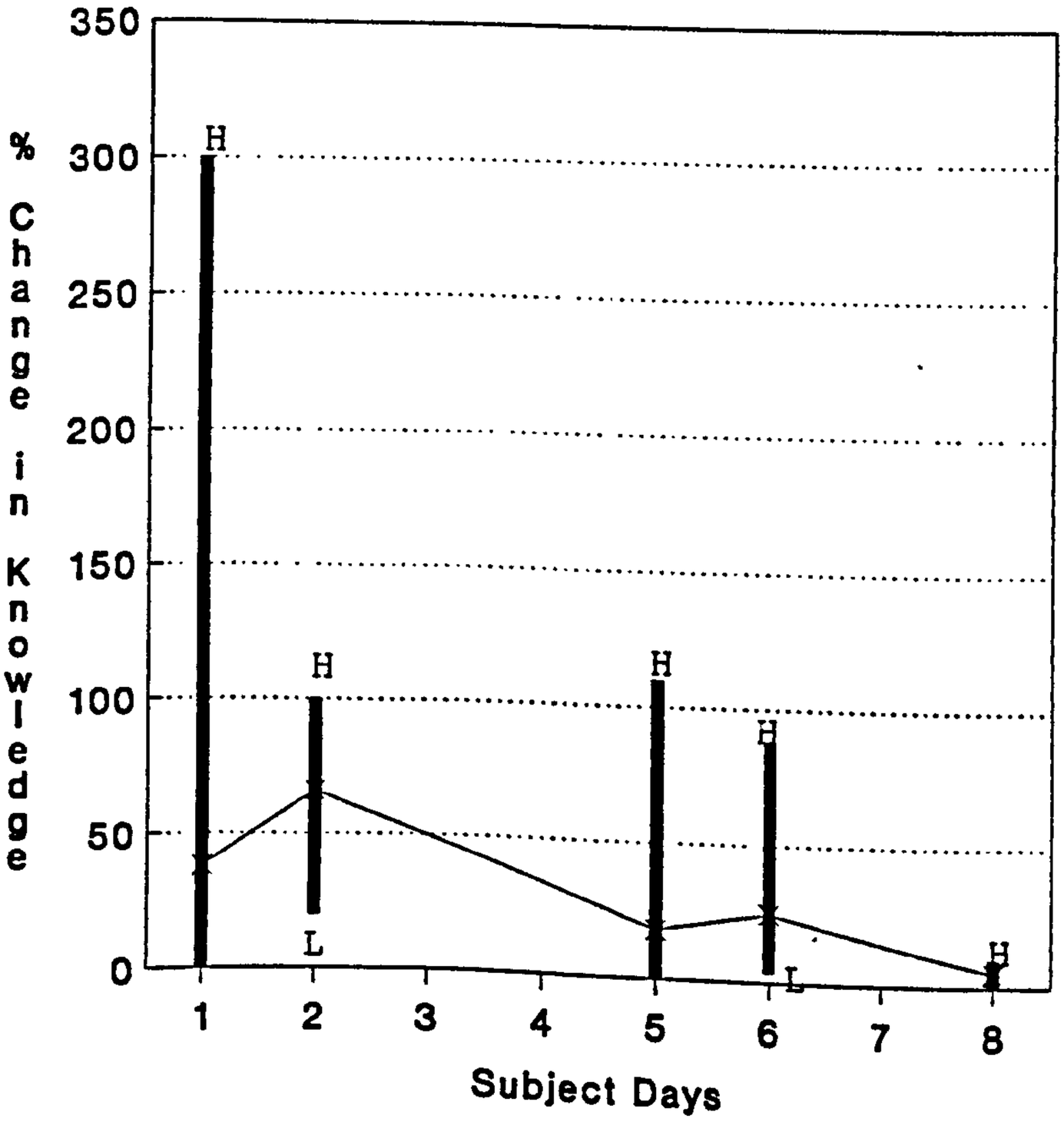


Figure 41 demonstrates the problem of non-uniform distribution of inceases and averaging (calculating the mean) when considering the success of a subject day for individuals on the course.

The figures 41, 42 and 43 show the range of % increases in knowledge from H, the highest, to L, the lowest (block) and the median (line). The median has been chosen rather than average to illusrate the fact that there was unevenness within the range of percentage increases, e.g. three trainees may score 100% increases and two trainees score 5% and so the median is 100% and the average is 62%. The increases in knowledge vary from zero to 300% with quite a number of assessments around 100%. This should be in part a measure of the perceived success of the subject day training courses.

Any subject day that records a low percentage increase in knowledge does not necessarily mean that the day was unsuccessful but perhaps that the level of subject knowledge of the attenders is already considerable and necessary for staff involved in some sections of the pig unit.

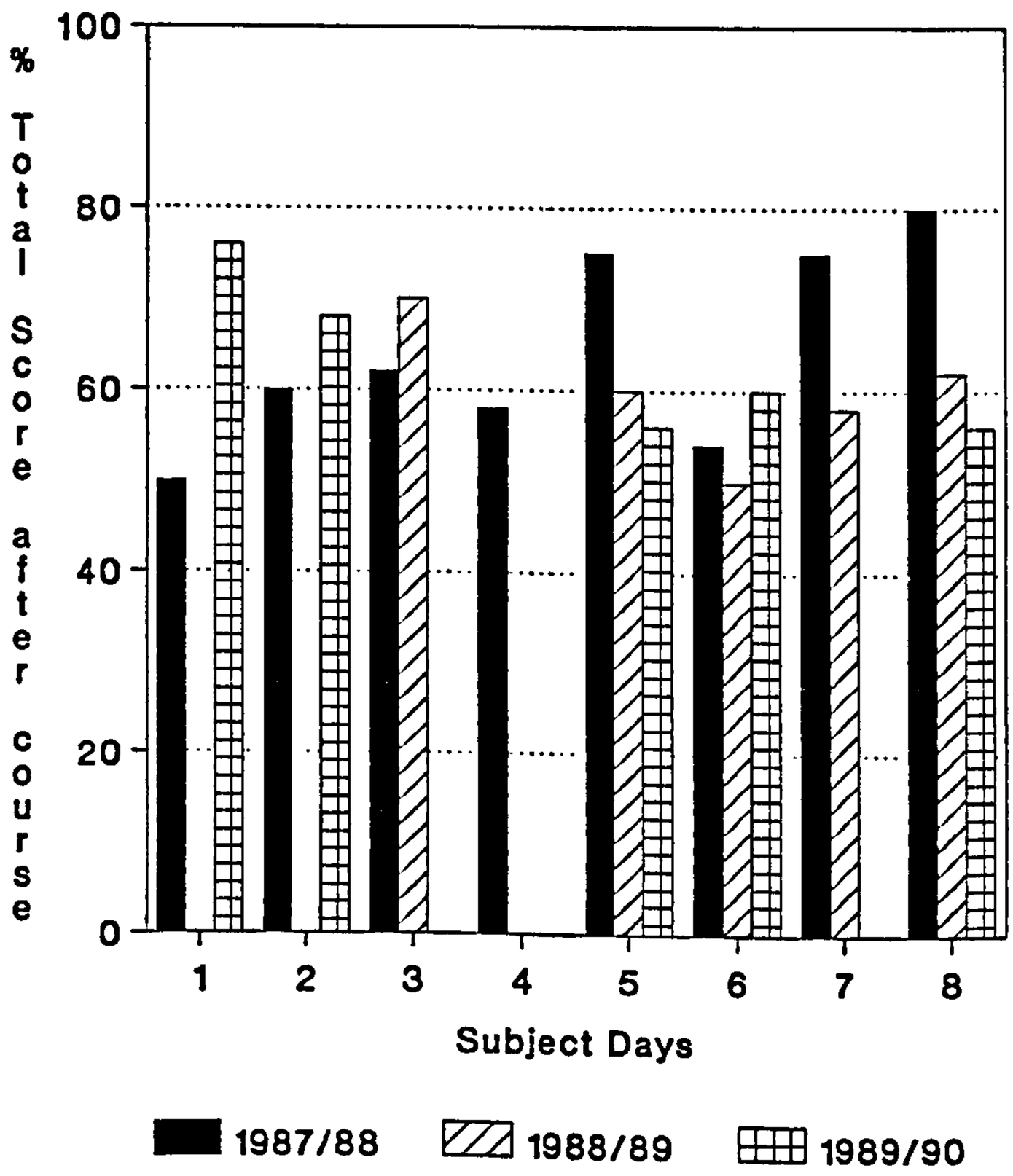
The course attenders were also asked to answer some specific, single word/figure answer, questions along with the self-assessment questions. The general average level of achievement was in the range 50 - 80% success at answering these questions with the average coming out at 64%, Figure 41. This may point to the following features:

(i) the attenders are not academics and will find it hard to retain factual data in their heads,

(ii) the attenders would normally refer to texts or the pig unit manager for this type of information,

(iii) the attenders were not able to grasp these ideas on the day.

Figure 44. The Average Knowledge Scores for Attenders on Subject Days



(iv) the subject area was not presented in a format that was familiar and practical for the older experienced course attenders.

The data shown in Figure 44 shows that the retention of knowledge at the end of each day is at the 63% level on average for all three years (64%, 60%, 63% respectively). The scores in Figure 43 relate to the Pre-then now and Then-now only.

questionnaires used for the three courses studied under Stages IV, VII and VIII in Figure 23 and subject days listed in Figure 36. This is an acceptable level compared to formal examination results in agricultural education (40-64% pass, 65-74% merit, 75%+ distinction). With this successful data supporting the benefits of training, the course attenders should be compared with a control group. This will be assessed under 5.2.7. The data should evaluate the "before" and "after" scores for attenders with the control group who receive no formal training.

The questionnaires were also used to collect information concerning the level of skills that were self-assessed and on some subject days were tested on a semi-formal scale.

5.2.5. The Analysis of Changes in Skills Data Collected from each Course Group in the study

The level of skills was evaluated by using similar type of questions to those collecting knowledge data. The course attenders were requested to self-assess their level of skills "before" and "after" the course at the end of each subject day as part of Stages IV, VII and VIII in Figure 23. The average percentage increases in skills shown in Figure 45 for the three courses on the range of subject days offered by the training group. The 1988/89 and 1989/90 courses did not offer all eight subject days as the Pig Company decided to concentrate on five subject areas. Once again there was quite a variation in average percentage increases when related to subject days, listed in Figure 36. Increases in excess of 40% were recorded for six out of the eight subjects. The final session on Reducing Piglet Mortality, subject day 8, seems to show the

least response with equally poor responses on increases for Aiming at Maximum Conception, subject day 5, and Practical Gilt Selection", subject day 6. The poor increases may be due to a perceived high level of initial skills of the course attenders in the subject areas required to achieve success on their units.

A new subject area, e.g. Condition Scoring of Pigs, requires new skills which can be demonstrated on the day and practiced by the attenders and used on their units. The percentage increases are high as one would expect with a new technique introduced to improve unit performance.

Figure 45. The Average Percentage Increase in Skills for the three Groups of Attenders

Figure 46. The Range of % Increases of Skill for each Subject Day for the 1987/88 Training Course Group

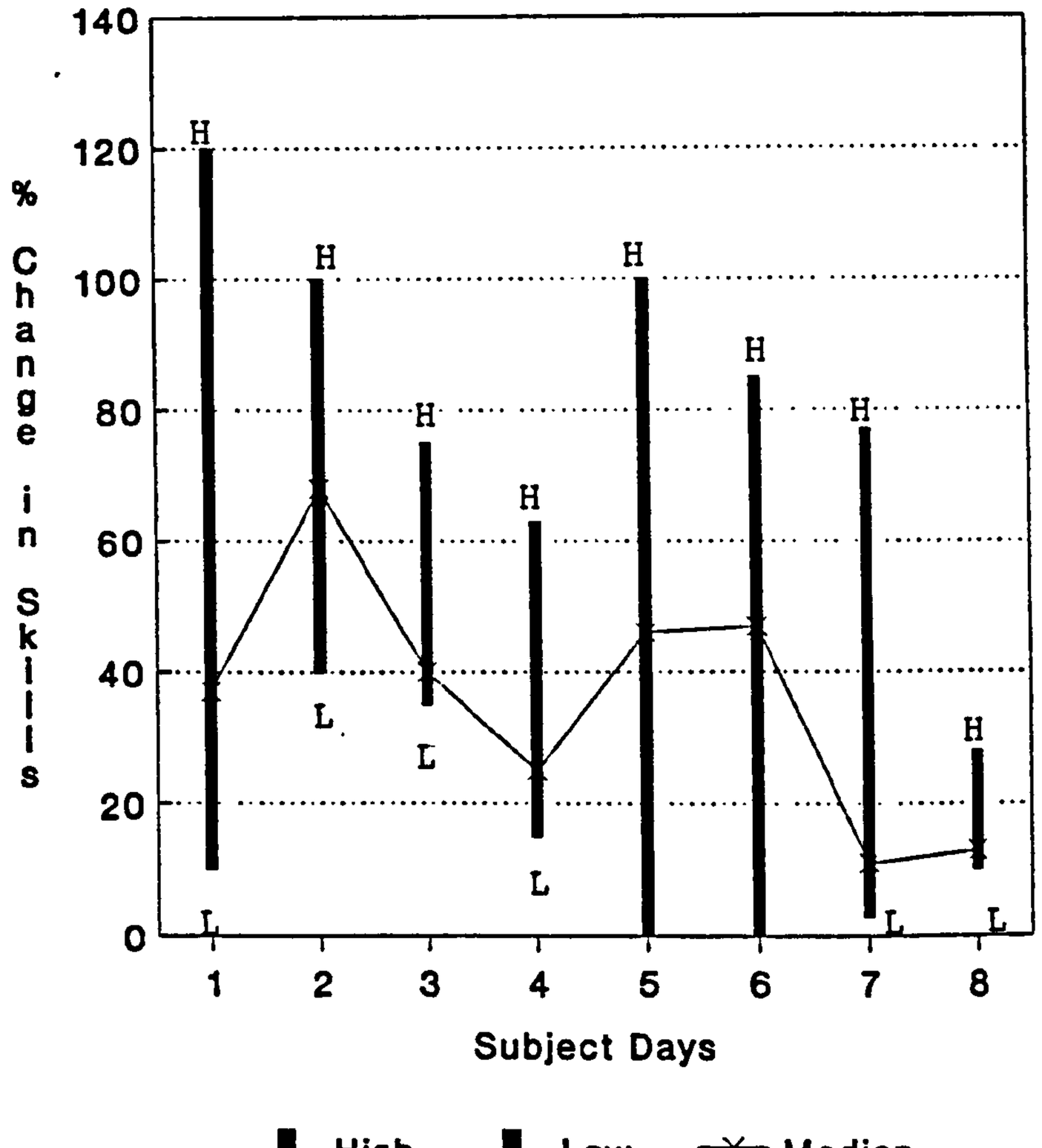


Figure 47. The Range of % Increases of Skill for each Subject Day for the 1988/89 Training Course Group

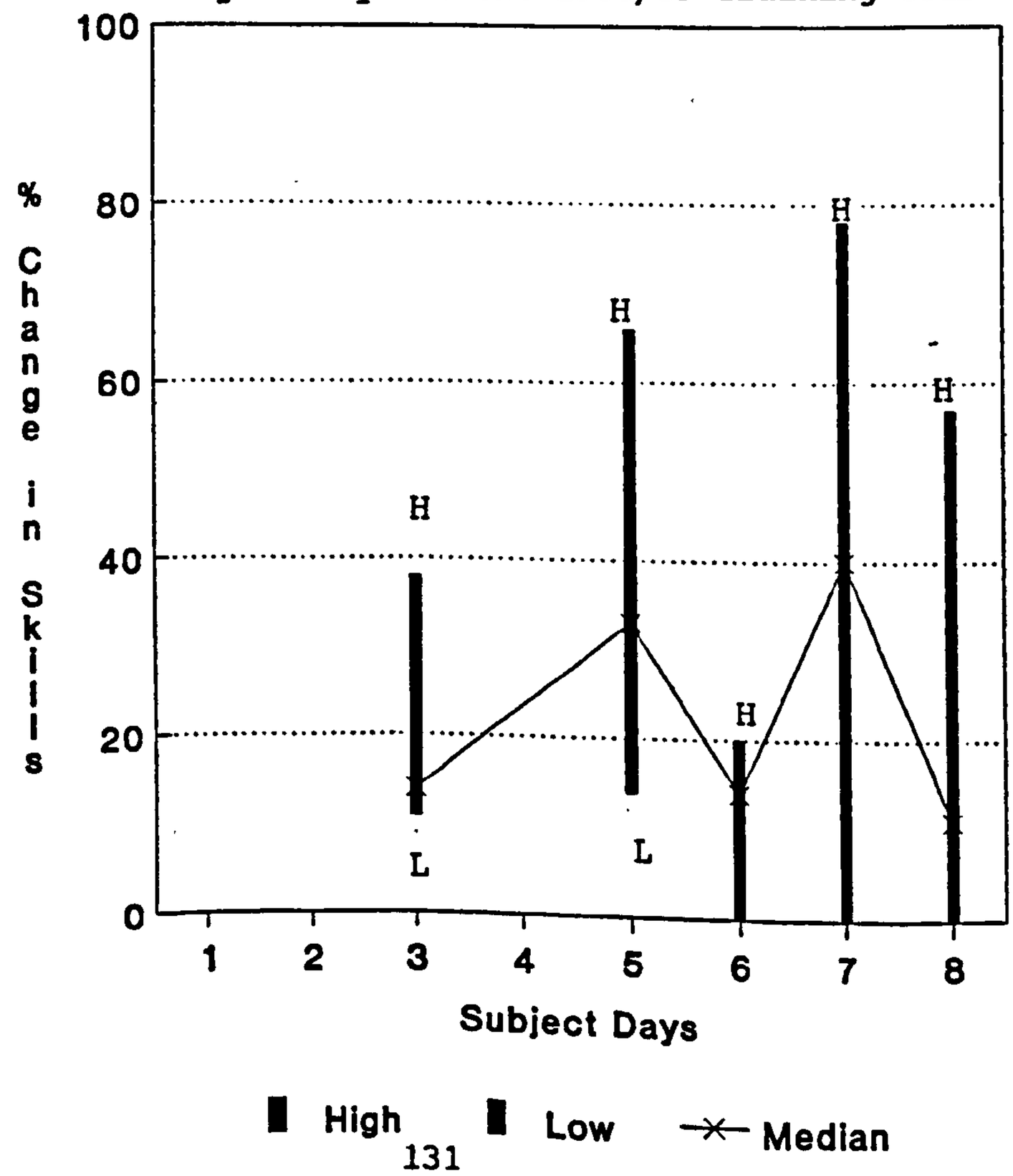
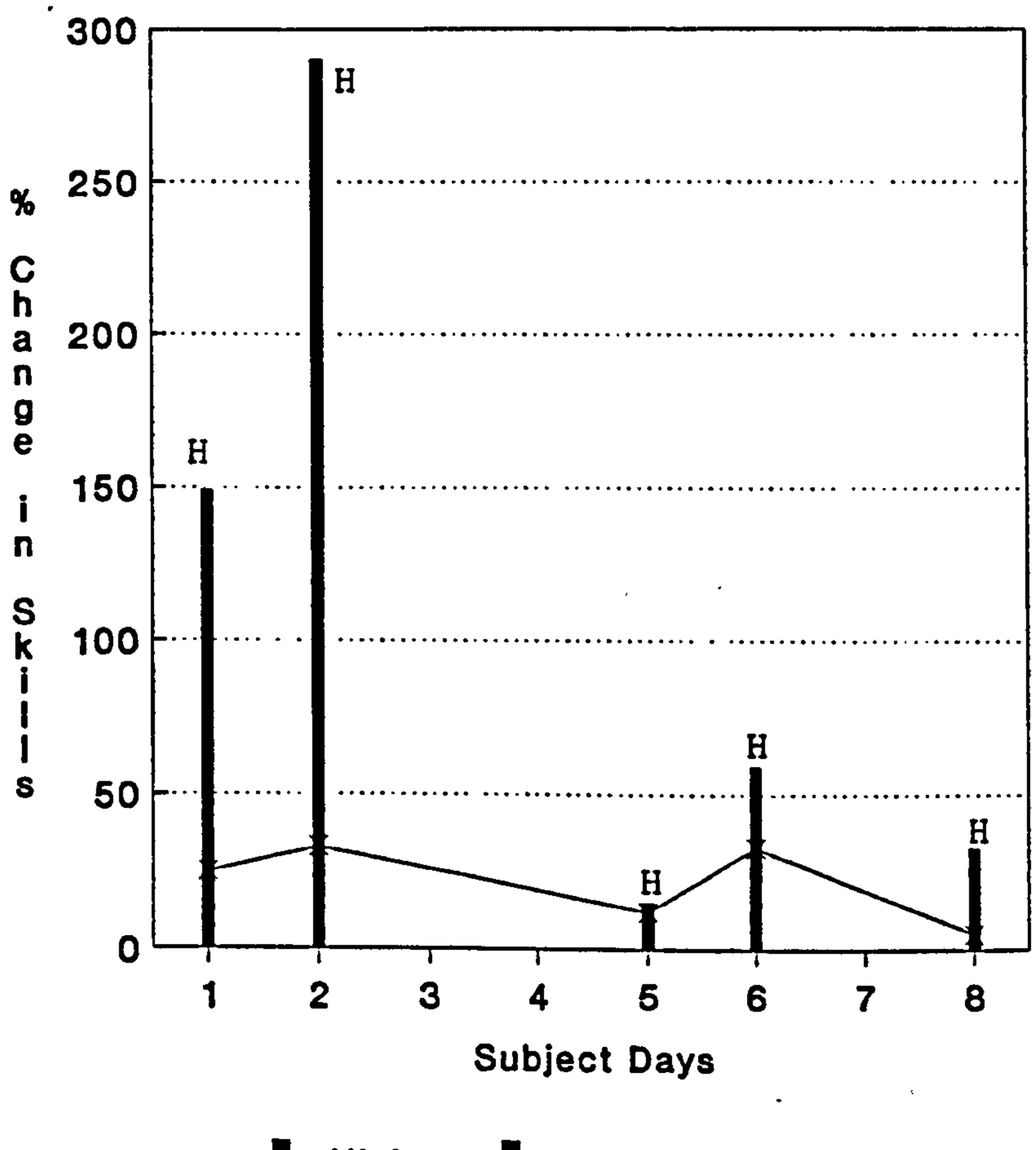


Figure 48. The Range of % Increases of Skill for each Subject Day for the 1989/90 Training Course Group



These average percentage increases may conceal the range of self-assessed scores attributable to levels of experience. Figures 46, 47 and 48 show the range of improvements and scores of up to 290% increase and as low as zero were given. The success of the subject day in terms of the advancement of skills will depend upon the following observations:

(i) the practical nature of the course attenders employment would need a high skills content,

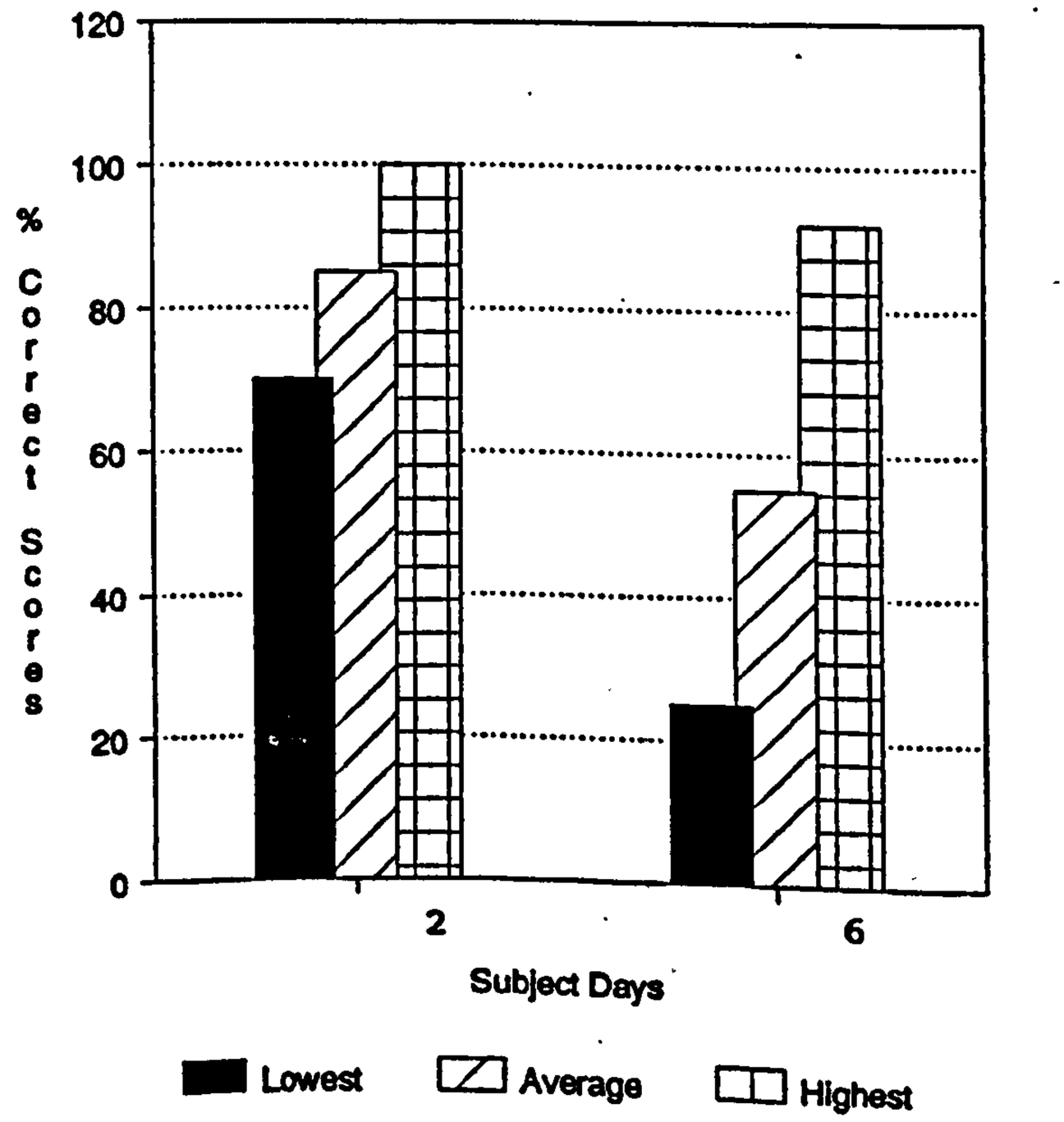
(ii) many skills would be passed on by experienced staff and unit managers and supported by skills training,

(iii) the non-academic nature of the employees would probably increase the perceived level of skills.

The facilitator for the subject days was able to provide practical sessions to assess new skills in connection with two of the subject areas.

There were practical sessions as an integral part of the Condition Scoring, subject day 2, and Practical Gilt Selection, subject day 6 from Figure 36. These proficiency tests evaluated the level of success achieved by the course attenders in the new skills that they had acquired during the day. The data was collected on the questionnaires given out at the end of the training days for all the courses assessed in this study, Stages IV, VII and VIII in Figure 23. Figure 49 shows the success rate that was achieved by the pigpeople when they were condition scoring sows and selecting gilts for breeding compared to the tutor's evaluations of the livestock. The tests were carried out on the farm as part of the subject day session.

Figure 49. Average Scores and Range of Scores for Skills Areas Tested



A high level of accuracy was achieved with the scoring of sows (85% success rate) using the system explained by the tutor. The ability and authority to translate that score into action taken on the unit is open to debate and will be discussed later. The lower success rate (55%) achieved by the attenders who were selecting gilts to go into the unit demonstrates the variability between selectors who were given the same guidelines by the tutor that were open to different interpretation by the tutees. The scores were collected using the questionnaires in Appendix E, F specific to the subject days and in particular question "4" on the Condition Scoring questionnaire and question "11" on the Practical Gilt Selection questionnaire.

The guidelines contain as many quantified aspects as possible but still leave some areas for subjective judgements. The tutor did note in his comments upon these sessions, that "the tutees had selected gilts that would be readily acceptable in most commercial units but some were more acceptable than others if one was being highly critical".

With this data on skills that seems to support the benefits of training, the course attenders should be compared with the control group. This will be reviewed in Section 5.2.7. A comparison between the Then-now self-reports scores for attenders at the 1987/88, 1988/89 and 1989/90 courses with control group scores will be shown so that an evaluation of the benefits of training can be more rigorously tested. The self-report scores that are compared will be knowledge, skills and attitude increases, shown in Figures 40, 43 and 46, over the training period.

The questionnaires were also used to collect information concerning the level and change of attitudes over the training period. They were self-assessed using rating scales, as part of the Pre-then-now and Then-now questionnaires used for all the courses and shown in Appendices E and F.

5.2.6. The Analysis of Changes in Attitude Data Collected from each Course Group in the Study

Over the training period, the course attenders were subject to changes in attitude with regard to confidence to complete jobs and to use knowledge and skills for a more "management" type of approach to running the units or sections of the unit. Some of the questions requested a self-evaluation of possible attitude changes in the following areas:

(a) analytical approach,

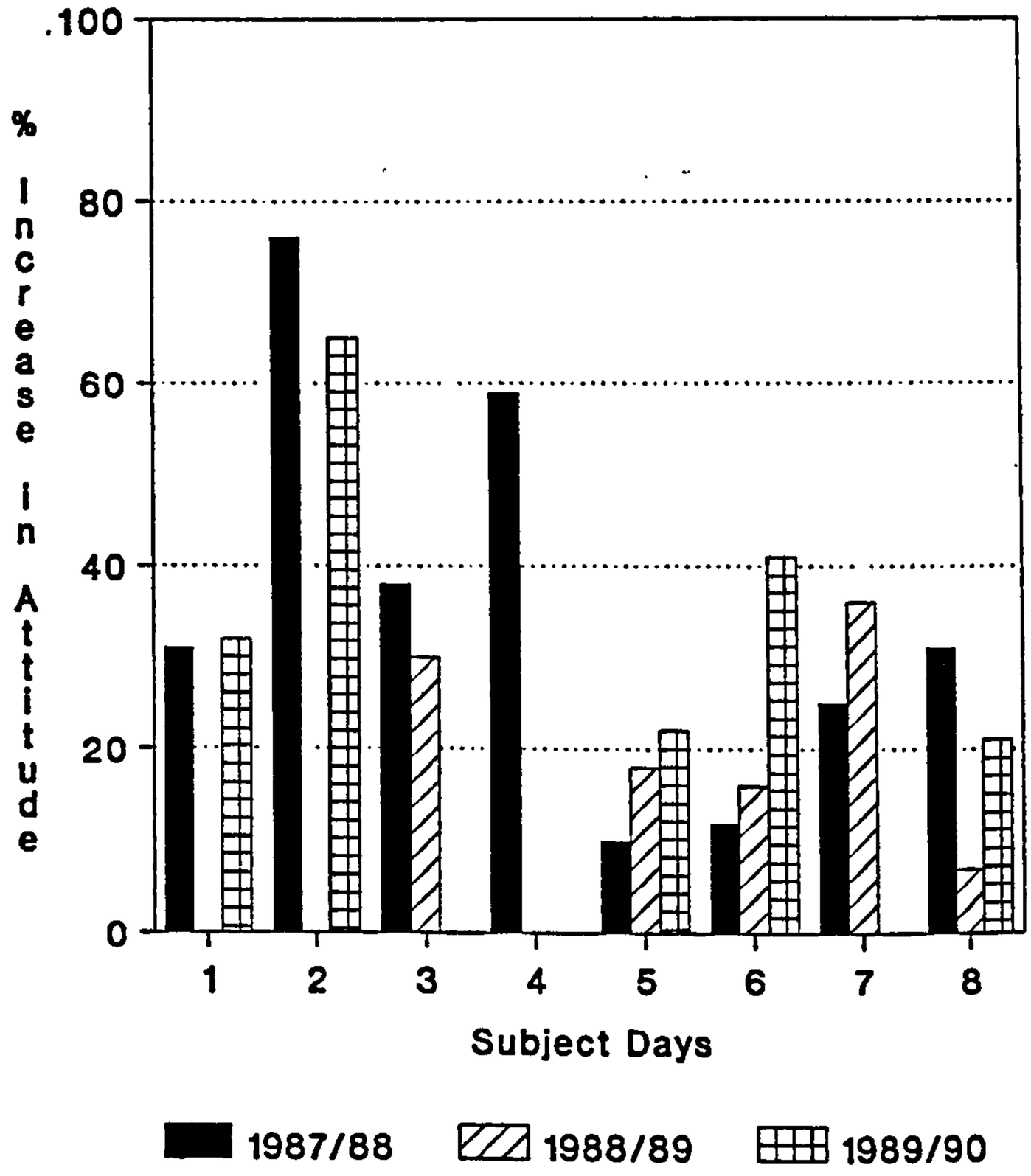
(b) communicative/consultative approaches,

(c) responsible/responsive approaches,

(d) systematic approach to technical updating

The average percentage increase in attitude can be seen in Figure 50 for the three groups attending training in the period from 1987-1990. Once again, it must be noted that the 1988/89 and 1989/90 courses concentrated upon five subjects and not eight.

Figure 50. The Average Percentage Increase in Attitudes for the three Groups of Attenders



The increases recorded from the questionnaires forming Stages IV, VII and VIII of the data collection, Figure 23, were fairly modest, i.e. below 40% for many of the subject days, apart from Condition Scoring 76% and 65%, subject day 2 and Boar Care and Effective Service 59%, subject day 4. Large increases may indicate large changes in attitude towards new ideas and concepts. New subject areas, e.g. Condition Scoring and Boar Care, may require new attitudes to be employed by the course attenders. This is reflected in the responses given by these participants. Subject day "6" training, Practical Gilt Selection, should have recorded large increases in attitude to reflect the high increases in knowledge and skills shown in Figures 40 and 45. This was not shown due in part to the

recorded view of some trainees that, "the boss always picks the breeding stock".

The average percentage increases may conceal the range of self-assessed scores attributable to many new and different attitudes to the subject areas for the training days. Figures 51, 52 and 53 show the range of improvements from zero to nearly 140%.

Figure 51. The Range of % Increases in Attitude for each Subject Day for the 1987/88 Training Course Group

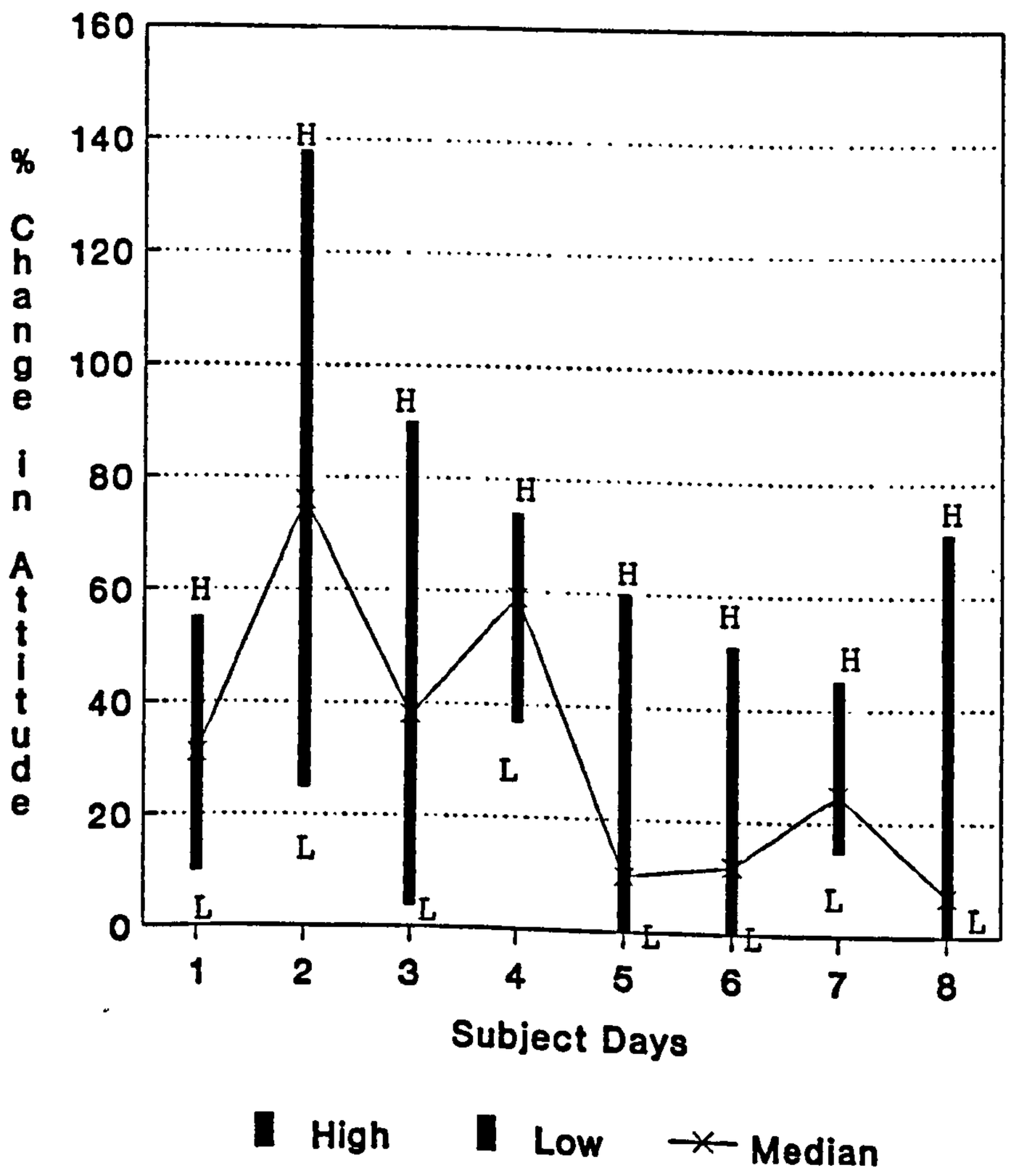


Figure 52. The Range of % Increases in Attitude for each Subject Day for the 1988/89 Training Course Group

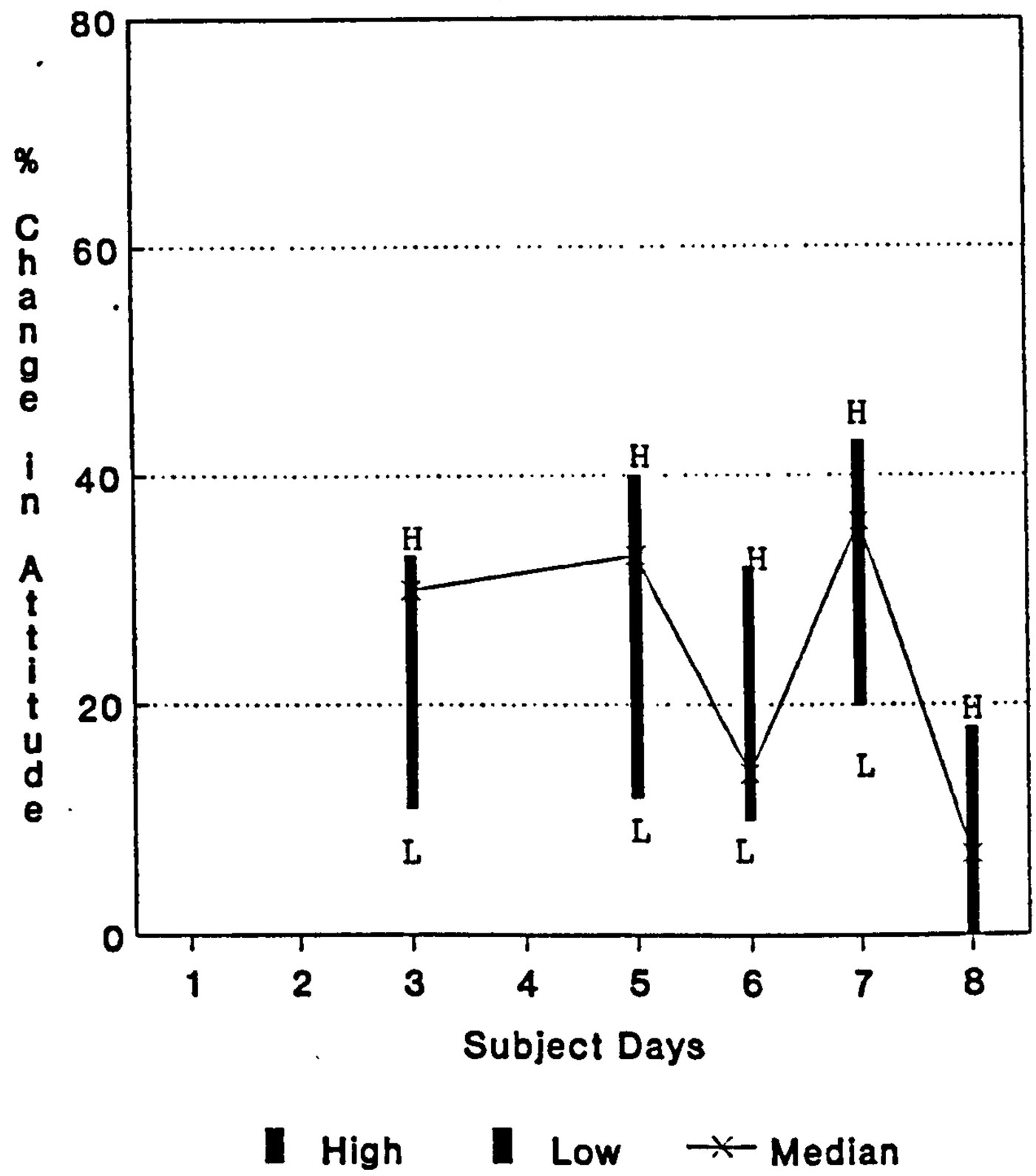
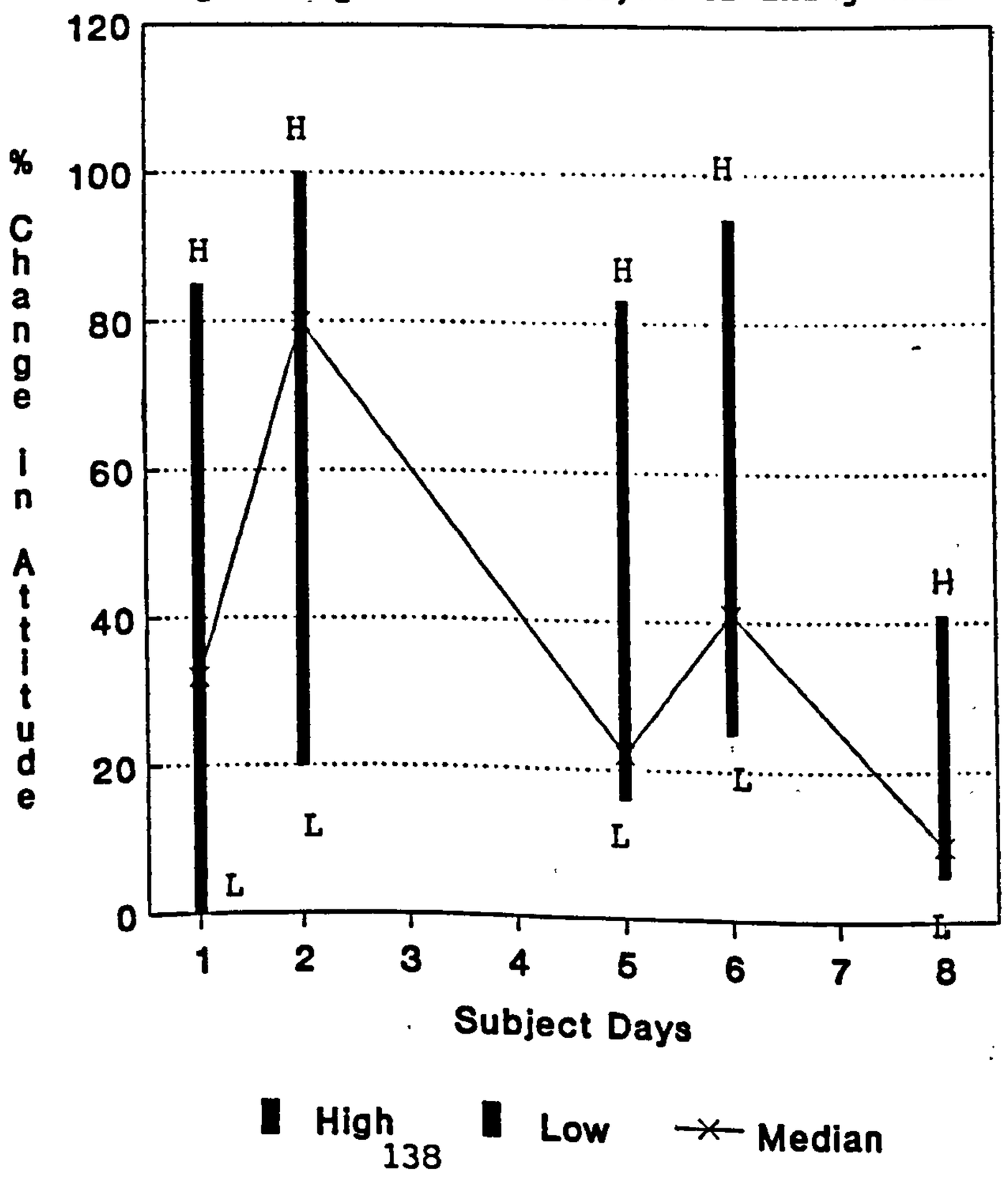


Figure 53. The Range of % increases in Attitude for each Subject Day for the 1989/90 Training Course Group



The success of the subject day in terms of the changes and improvements in attitudes will depend upon the following considerations:

(a) the subject area covered - its applicability and whether it was new to the trainees,

(b) the teaching style employed and the environment in which the subject day was spent,

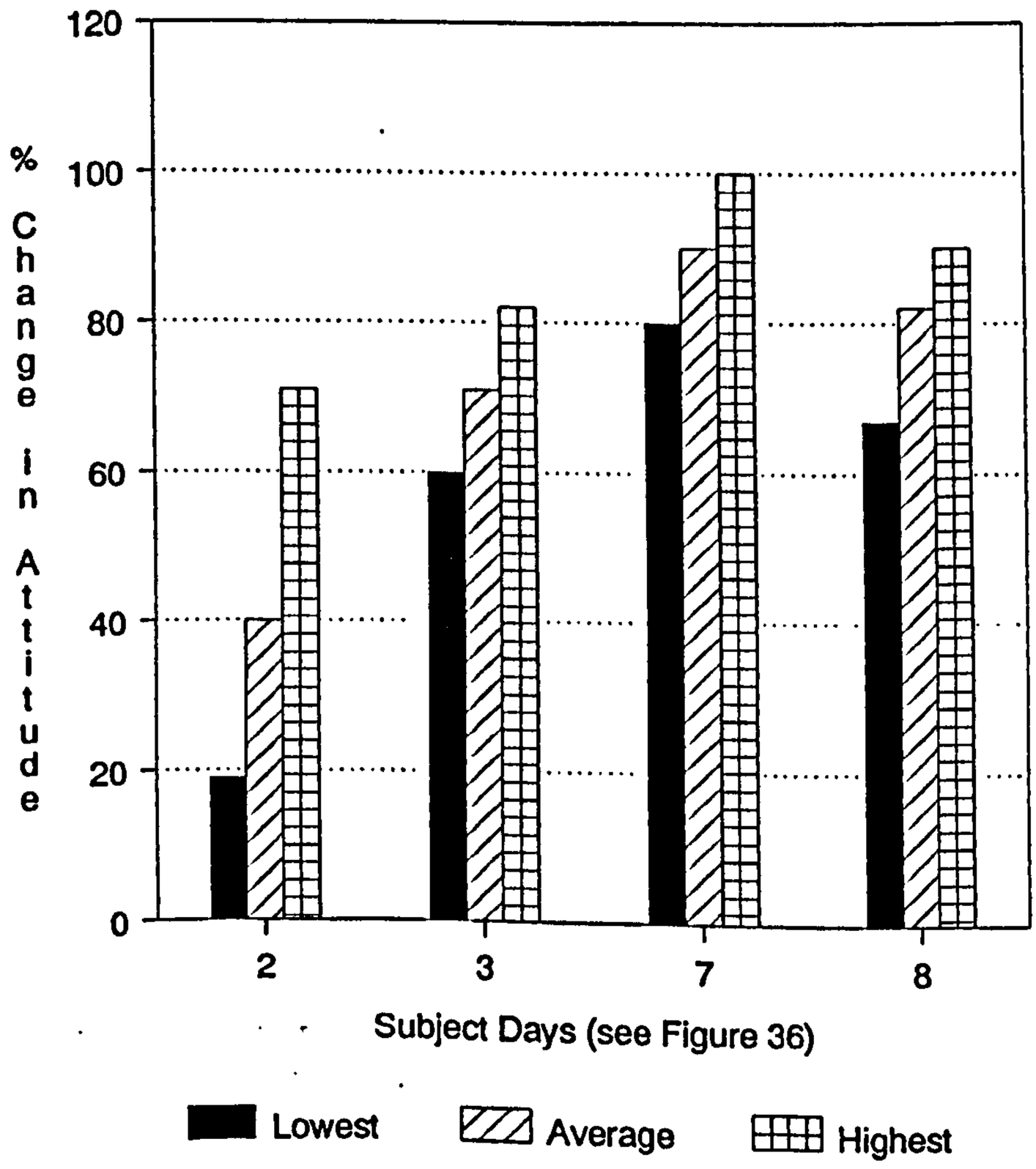
(c) the experience and position held in the organisation of the trainee with regard to the ability to introduce new attitudes into the business.

The tutor for the subject days spent some time discussing the various attitudes towards pig management, man management and other resource management. The questions within the Pre-then-now and Then-now questionnaires used for all three training courses ranged over topics that are directly related to the attitudes of pigpeople on the course, copy in Appendix E, F and especially Question 13 on Disease Control and Prevention questionnaire and Question 6 on Infertility in Pigs questionnaire.

Some of the questions asked the trainees to assess the priorities involved in certain sections of the unit along with their confidence to use records for management purposes, e.g. sow service records, veterinary records and litter cards. Their confidence measures showed levels from 22% to 100%. Subject day 2 training dealt with condition scoring of sows, a new approach to managing the sow. A 40% average increase was recorded which may reflect the view that "the trainees were convinced of its usefulness even if the managers were not".The subject day number 3 concerning the infertility in pigs, in

Figure 36, showed a need for action and various priorities and attitude towards poor pig fertility, Question 9 on the questionnaire for subject day 3, Appendix E and F. Attitudes towards the buildings and physical aspects of the pig units were assessed on the subject days 7 and 8; Disease Control and Prevention and Reducing Piglet Mortality. The use of records for unit management purposes was also evaluated on another subject day. The following data shows the attitudinal aspects, see Figure 54.

Figure 54. The Range of Attitude Changes for Specific Subject Days



Attitudes to specific subject days numbers 2, 3, 7 and 8 respectively are shown above and the levels of increase are high in many cases. This should give the company a set of trained staff who have been asked to assess carefully their attitudes in both practical and hypothetical areas (reviewed in Jinks 1979). The problem may occur when the staff attempt to put some of their new attitudes into practice on their units.

The next stage is to put this data into context when compared to a control group of pigpeople of similar age, experience and internal unit management structure. The main difference is the lack of a training scheme for these pig units.

5.2.7. A Comparison between the Training Course Groups and the Control Group

The main characteristics of the Control Group staff and the physical data associated with their pig units has already been discussed, Figures 30 to 35 and Tables 6 to 9. The factor that is fundamentally different between the Control group and the total of pig courses population, called the Training Course Groups, is the lack of organised and progressive pig enterprise training attributable to the Control Group. The staff are "trained" by staff already on the unit and depend upon the unit manager for any further guidance. They perceive that they are highly skilled with levels of knowledge to cope with any problems. The Control Group have many features in common with a collaborative study by Seabrook (1985). In his research study, pigpeople from six companies assessed their abilities as high for areas of knowledge and skills. However there were many areas of concern recorded in the report which may have reflected the low level of training:

(a) The unit managers were responsible for training their staff but usually protested that there was too little time to do it and make a success of it.

(b) Off-the-job training was rarely used and older staff were not interested in training.

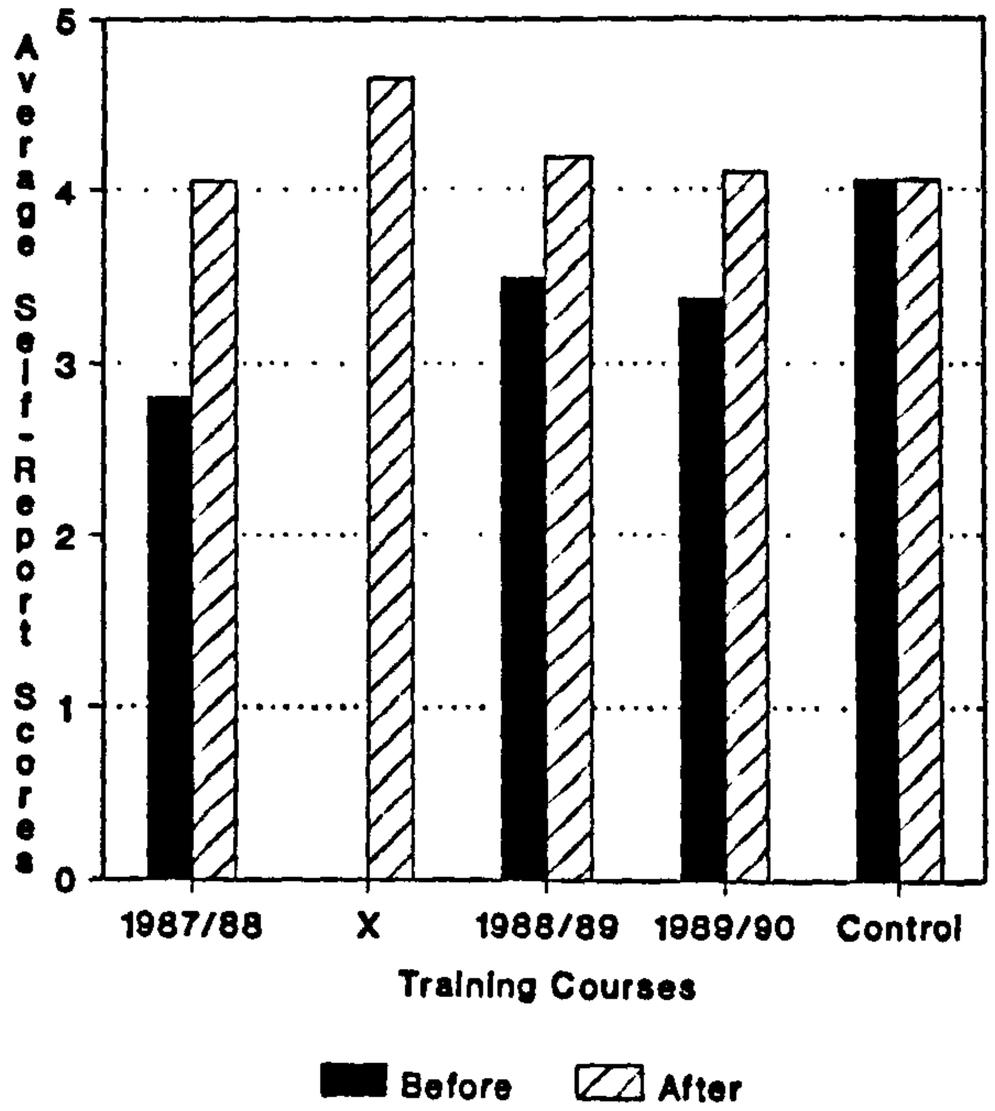
(c) There was a heavy dependence upon "observation and common-sense" and a very low level of reserve of skills and knowledge that could be drawn upon by the unit managers; he is the "expert".

(d) The staff were progressive and willing to change but their philosophy revolved around an overall reactive approach rather than proactive.

(e) There was a deep felt concern for the pigs and the stockpeople relied heavily upon the use of their "eyes and ears" and did not use all their "stockmanship" skills.

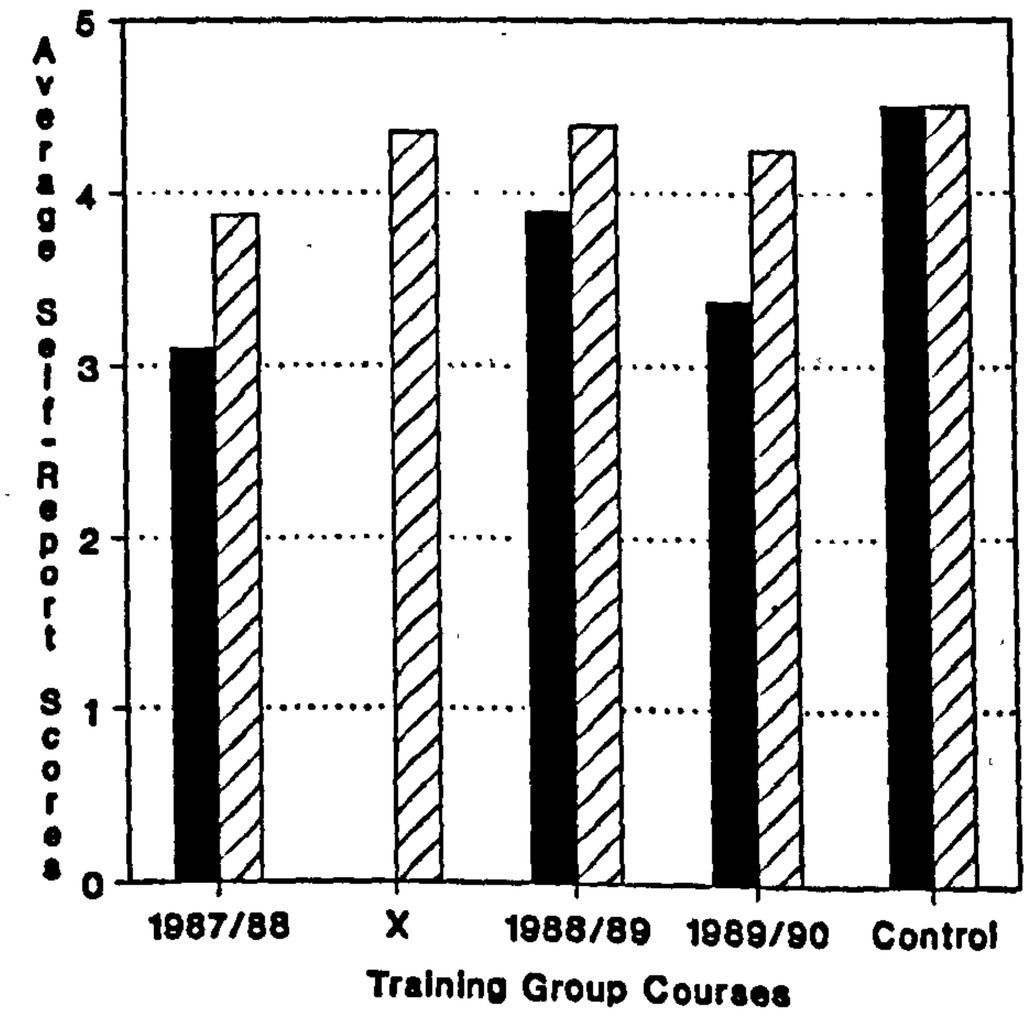
The Control Group used in this study displayed many similar features to the collaborative group from the study by Seabrook (1985) and could be the profile for staff within this type of pig company. The Control Group was compared with the Training Course groups in the areas of average self-report scores for knowledge, skills and attitudes.

Figure 55. A Comparison between the Assessments of Knowledge for the Training Course Groups and the Control Group of Pigpeople



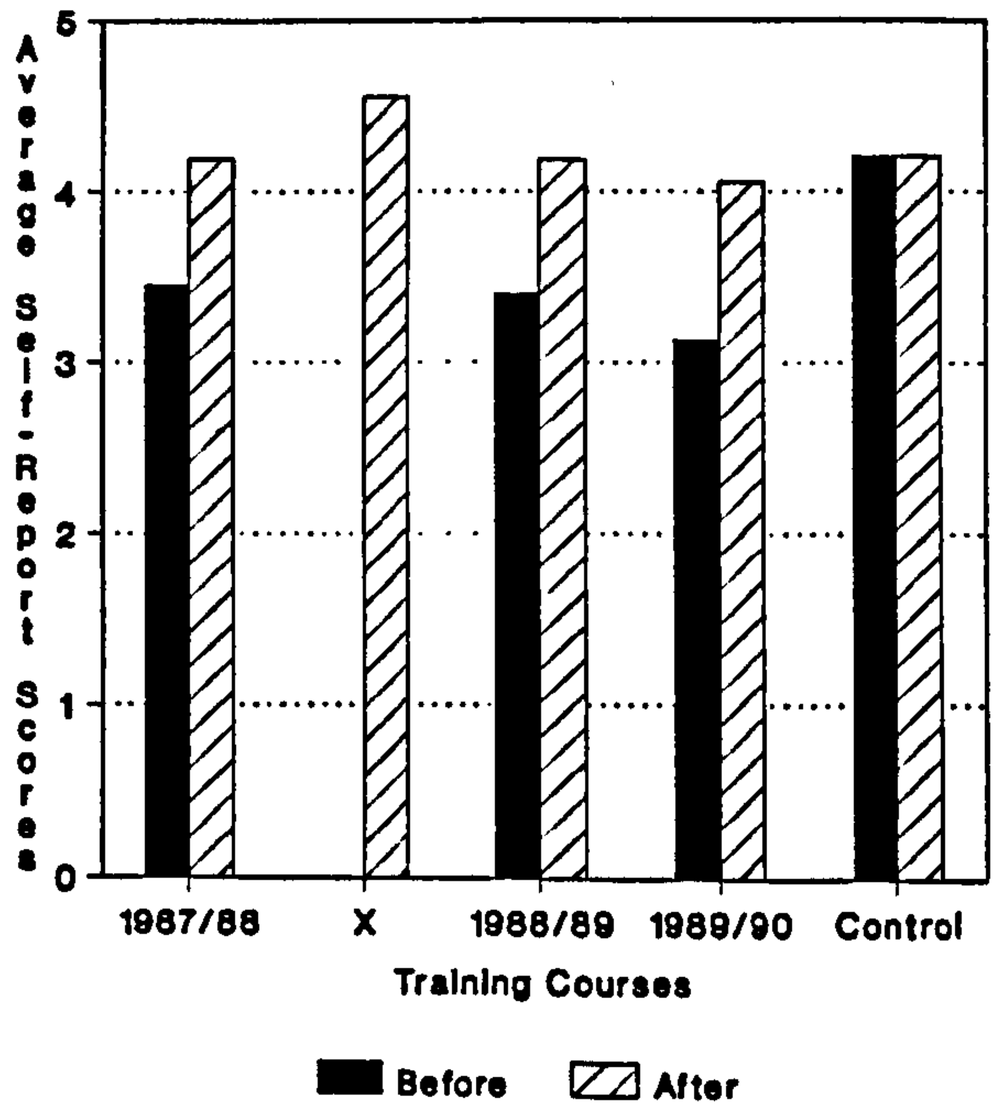
Key: Score "0" - no knowledge
" "5" - complete knowledge
X - 1987/88 group retested 1 year after training

Figure 56. A Comparison between the Assessments of Skills for the Training Course Groups and the Control Group of Pigpeople



Key: Score "0" - no skill
" "5" - complete skill
X - 1987/88 group retested 1 year after training

Figure 57. A Comparison between the Assessments of Attitudes for the Training Course Groups and the Control Group of Pigpeople



Key: Score "0" - no attitude
" "5" - no attitude
X - 1987/88 group retested 1 year after training

Figures 55, 56 and 57 show the knowledge, skills and attitude levels that were self-assessed and specifically tested for the Control Group and the Study Group. A further section of data is included and concerns the re-testing of the 1987/88 course after one year had passed to see if there was any change in their scores, compared to the score given immediately the course had ended.

If the knowledge aspect is considered first then the data from Figure 55 shows that the Control Group perceived that they have a higher level, scoring 82%, than any of the Training Course Groups who scored 56%, 70% and 66% for the 1987/88, 1988/89 and 1989/90 courses respectively, "before" the course was run. "After" the training had taken place, the Training Course Group have equalled and overtaken the Control Group. One year later

the 1987/88 Training Course Group group is even more aware of its higher knowledge base, scoring themselves at 95% which may be due to the series of training sessions. The Control Group were confident concerning their knowledge level but they may not have been aware of the full depth and breadth of the information expected from pigpeople in all sections of the unit. There were some direct, factual questions asked about specific areas of knowledge, in the questionnaire Appendix F and although the answers were good, they did not match up to the levels expressed by the trained pigpeople in the Training Course Group.

The Control Group, as one would expect, believed that their level of skills ability was very high, 90% scores shown in Figure 56. Many of the contributors recorded full marks when responding to self-assessment questions related to skills. Once again this would be a reasonable reaction for experienced staff who are told that they are doing a good job and remaining in regular employment. The level of skills was assessed against the level expected and shown by the unit managers and head pigpeople. This may not be the level required by the Agricultural Training Board who run a National Proficiency Test scheme and who also indirectly arranged the courses for the Training Course Groups.

The Training Course Groups recognised that a high level of skills and ability was required of them and so scored themselves at 62%, 78% and 68% proficient "before" the courses and 78%, 89% and 85% proficient for the 1987/88, 1988/89 and 1989/90 courses respectively "after" the training. This did not equal the Control Group who were 90% confident in their

ability to perform the skills mentioned in the questionnaire. Once again a lack of perspective when considering the requirements for "proficiency" in a skill may not have been appreciated. This would lead to the possible hypothesis that a high degree of knowledge and skills should equate to a high level of unit performance both in the physical and financial spheres. This will be tested and discussed later in Chapter 6 and in the conclusions.

The final area for comment concerns the general attitudes of the Training Course Groups, Figure 57. Once again a high level of self-assessed confidence in the system employed on the unit and the management of all the resources including the staff. Attitudes are very important if the unit managers are going to take advantage of newly acquired levels of skill and knowledge gained by trainees who attend specialist courses related to pigs. The Training Course Group self-assessed their own attitudes at 70%, 68% and 62% for the 1987/88, 1988/89 and 1989/90 courses respectively, whereas the Control Group scored themselves at 85%. After finishing some training, all the groups were about equal with over 80% measures recorded. The method used to collect the data allowed the course participants to appreciate the volume of knowledge and full range of skills that were required. The attitude and approach to working efficiently and effectively is also of paramount importance if the pig unit is to function successfully.

The interesting point established by the data confirms the further increase of attitude score of the study group when assessed one year after the training has taken place. This may be a factor of the study group being able to use its new

knowledge and skills and so reaffirm any attitudinal changes that took place and were recorded by earlier assessments. An earlier study by Girdler (1984) looked at the self-assessed responses from a range of experienced and inexperienced shepherds. The author requested measurements of knowledge, skills and attitudes within a framework of shepherding tasks and ability to detect and deal with problems (knowledge and attitude aspects). The shepherds were reported as scoring an increase of 27% in confidence to perform a whole range of tasks. These could be broken down into areas requiring knowledge, skills and attitudes and the scores were 26%, 24% and 32% respectively. The shepherds were also asked to record whether they considered the subject days would give them "a little" or "a lot" of confidence to run their units more effectively and efficiently. They scored 46% for knowledge and 38% for confidence to perform tasks and also to diagnose problems in order to save livestock and increase unit profitability. The Pig-Training Course groups recorded increases of 29%, 21% and 24% for knowledge, skills and attitudinal changes when the average self-report scores for the three training groups were aggregated.

The results are fairly similar for the two studies by Girdler (1984 and 1990) of experienced agriculturalists. The data collection methods were different with the first study using a Pretest, Post-test design and questionnaires that were completed "before" the course began and again at the end. The current study is using a questionnaire that is completed at the end of the study and requesting assessments for both the levels at the start and end of the study period, the Then-now design

discussed in Chapter 3. The 1987/88 course were also given a Pretest as well as the Then-now questionnaire so that comparisons could be made as reported in Section 5.2.4. and 5.2.5.

The results reported so far have looked at the pig unit physical efficiency factors and the self-reported assessments of the trainees on pig training courses. Comparisons have been made between the Training Course Groups and a Control Group whose organisation structure is similar to that of the Training Groups. The main difference is the fact that the Control Group does not have a pig course training programme provided by an outside agency or individual. The results may have given some support to the choice of technique chosen to collect the data. The next chapter analyses the data collected and tests for correlations and reliability factors. Investigation into the area of the trainability of pigpeople is also pursued to add a further dimension in the explanation of the data collected.

CHAPTER 6

AN EVALUATION OF THE PARTICIPANT'S RESPONSES TO THE DATA COLLECTION TECHNIQUES (PART 2)

Further work on the data collected by the questionnaires moved into the second phase of analysis. Responses to the questions have revealed some interesting trends in knowledge, skills and attitude level increases. The pig unit physical performance was also evaluated for determination of improvements and/or deterioration in results. The next stage involved a statistical analysis of the self-reports and the physical performance and a check made on data variation and a test for any significant correlations between these two areas of collected data. Further information on the stockpeople was also collected in the form of a psychological test whose results may support the hypothesis and give some idea of staff trainability.

6.1. Statistical Analysis of the Questionnaire Data and Testing for a Correlation between Unit Physical Performance factors.

Individuals did not attend the whole series of subject days, unlike the earlier study by Girdler (1984), and so the improvements recorded are related to a specific population for the subject day and not a population attending the whole series of training session, Figure 58.

Figure 58. Subject days and Relevant Unit Performance Factors

Subject Day	Unit Performance Factor
1. Basic pig health	Pigs reared/sow/year/ Mortality
2. Condition scoring	Pigs reared/sow/year
3. Infertility in pigs	Litters/sow/year Pigs reared/sow/year
4. Boar care and effective service	Litters/sow/year Pigs reared/sow/year
5. Aiming at maximum conception	Litters/sow/year Pigs reared/sow/year
6. Practical gilt selection	Potential pigs reared/ sow/year
7. Disease control and prevention	Mortality
8. Reducing piglet mortality	Mortality

6.1.1. The Variation of Questionnaire Data

A statistical analysis of these improvements was carried out for the groups and populations in the study, Parker (1976). The computer program "statspro" was used to assess the variance between the respondents and the self-rating scores given by each participant for knowledge, skills and attitude levels. The 1986/87 "Pilot Study" training course attenders showed significant differences between themselves and the tasks self-reported when tested at the 5% level tasks. The between respondents variance for knowledge based assessments changed from F = 1.95 to F = 0.55 although not significant in both cases, still indicating a positive reduction in group variation possibly due to the training activity.

The between respondents variance for skills based assessments was reduced from F = 2.28 to F = 0.56, when tested at the 5%

level, showing the same trend as the knowledge areas. The respondents have now been trained to a similar level and their responses demonstrate this feature, similar results to those reported in Girdler (1984).

The computer program was then used to look at the much larger group of trainees on courses from 1987 to 1990. The between respondents variance was also reduced with F values very similar to the 1986/87 study. The knowledge, skills and attitudes self-assessments, that were recorded for the subject days, were classified with regard to factors affecting pig unit physical efficiency figure, pigs reared per sow per year, piglet mortality and litters per sow per year, Table 10.

Table 10. The Variance between Subjective and Objective Data

	Knowledge	Skills	Attitudes
Pigs/sow/year	1.09	0.52	0.73
Piglet mortality	9.55*	7.49*	4.92*
Litters/sow/year	23.73*	6.52*	11.22*

* Significant by ANOVA F test with approximately 1 and 14 degrees of freedom at 5% level.

The F values shown in Table 10 look at the variance between the "before the course" and "after the course" data submitted by each course attender for the subject days that were related to pigs reared per sow per year, piglet mortality and litters per sow per year. The variance was significant for two of the physical performance factors analysed. Not all the courses took the complete eight subject day series and so the data varies from 1987/88 - 8 days, 1988/89 and 1989/90 - 5 days only. The numbers attending the three courses were also

variable so the impact of one unusually low or high score will impact upon the variance to a considerable extent.

An analysis of variance was carried out to test the significance of the variation between the three years of courses, Table 11. Each respondent had scored their level of knowledge, skills and attitudes before and after the course. The data gave the following F-values for this investigation.

Table. 11. Between the Courses Variance of the Participant Self-Evaluation of Levels of Ability. (F values)

	Before course	After course
Knowledge	8.60*	16.52*
Skills	7.92*	13.50*
Attitudes	12.27*	15.08*

* Significant by ANOVA test with approximately 1 and 45 degrees of freedom at 5% level.

The increase "after the course" may have been due to the fact that the participants were able to appreciate their new levels and so score themselves high after a low start. Some attenders may report that they have made little progress and so give low self-reported scores. With a new perspective on knowledge, skills and attitudes, the trainees are in a position to more accurately assess their ability. The Then-now design of data collection could increase the extreme responses due to the legitimate understanding of their true levels.

The researcher pursued the analysis of data by testing the variance of the self-report scores for the subject days (topic areas). The variance of scores was reduced for all the subject days tested for all three courses, Table 12.

Table 12. The Variance of Self-reported Assessments for the Subject Days

Subject-Day Assessments	Training Course Groups					
	1987/88		1988/89		1989/90	
1. Pig Health and Disease	Before	After	Before	After	Before	After
Knowledge	0.7	0.1			1.4	0.6
Skills	0.5	0.2			1.6	1.1
Attitudes	0.6	0.2			1.5	0.9
2. Condition Scoring						
Knowledge	1.3	0.2			2.5	0.8
Skills	1.4	0.2			1.2	0.8
Attitude	1.4	0.3			1.5	0.8
3. Infertility in Pigs						
Knowledge	1.1	0.3	0.9	0.2		
Skills	0.8	0.4	0.8	0.7		
Attitudes			0.5	0.2		
4. Boar Care						
Knowledge	1.5	0.4				
Skills	2.1	0.7				
Attitudes	1.1	0.5				
5. Aiming at Maximum Conception						
Knowledge	0.6	0.3	0.9	0.3	1.1	0.4
Skills	0.3	0.2	0.2	0.2	0.9	0.2
Attitudes	0.4	0.2	0.5	0.3	0.5	0.2
6. Practical Gilt Selection						
Knowledge	0.7	0.3	0.5	0.2	0.7	0.4
Skills	0.7	0.4	0.5	0.2	0.9	0.5
Attitudes	0.5	0.2	0.9	0.3	0.8	0.4
7. Disease Control and Prevention						
Knowledge	0.6	0.2	0.8	0.2		
Skills	0.7	0.2	0.4	0.1		
Attitudes	0.5	0.1	0.5	0.2		
8. Reducing Piglet Mortality						
Knowledge	1.8	0.2	1.1	0.9	0.5	0.4
Skills	2.7	0.2	1.3	0.8	0.5	0.2
Attitudes	1.6	0.4	0.8	0.7	0.7	0.1

Key: Before is variance of self-reports "before the course"
After " " " " " "after the course"

The researcher tested the variance of the self-report scores for the subject days as shown in Table 12. The variance of scores was reduced for all the subject days tested for all three courses. The overall variance for the 1987/88 course was reduced from 0.8 to 0.11 for the knowledge based, self-report scores (down by 63%). A similar picture for the skills assessments was also noted, i.e. overall variance 0.58 down to 0.16 after the training period (down by 26%). The attitude variance was also down by 30%. The 1988/89 course analysis of variance, carried out on the responses to self-rating questions by the participants, has shown that there is significant variation between participants (1986/87 pilot study) and courses followed from 1987 to 1990. There was a much reduced level of significance for the relationship between pig unit physical performance and subject day/topic assessments (self-reported ratings for levels of ability). The variation in response to ratings of ability "before" and "after" training in specific subject areas was an overall reduction but not at a 5% level of significance. There would seem to be a convergence of self-reported levels of knowledge, skills and attitudes between the less experienced and the experienced trainees. The inference would seem to be that the training is effective for these groups of attenders. The next section of this analysis will concentrate upon the reliability of the scales and their applicability to this study.

6.1.2. Scale Reliability Coefficient

The scale reliability must be tested to see if it had a significant effect upon the results. The reliability coefficient commonly used for this type of work is the Kuder-Richardson formula 20. It is applicable to tests whose

Kuder-Richardson formula 20. It is applicable to tests whose items are scored as right or wrong or according to some other all-or-none system. Some tests, however, may have multiple-scored items. On a personality inventory, for example, the respondent may receive a different numerical score on an item, depending on whether he or she checks "usually", "sometimes", "rarely", or "never". A generalised formula has been derived called Cronbach Alpha and is used in this study because of the multiple scoring in the rating scales Cronbach (1951). This reliability was calculated using the following formula (there are many):

$$rs = \frac{(1 - \varepsilon Si^2)}{(S_t^2)} \quad \frac{k}{k-1}$$

(Cronbach's Alpha or reliability coefficient)

Where εS_i^2 = sum of item variances

S_t^2 = scale variance

k = number of items in scale

There are 15 items in the whole scale.

The pilot study coefficient was 0.79

The main study coefficient was 0.74

This is fairly high because of the skewed nature of the distribution of confidence data. The coefficient has been calculated to show the reliability of the scale of tasks used for this study. It reflects their overall unidimensionality as a scale used in this study with every pigperson completing all the ratings on the questionnaires. Thus the reliability of the proficiency in knowledge, skills and attitudes scales has been calculated. There are problems with treating those items with which the pigperson had no experience on a unitary scale. The designation of zero is punitive and the pigperson could be

experienced course attenders. The scale items were tested on the pilot study group and this data was used to refine the main study questionnaire. Finally the potential correlation of the three areas of physical data with that of self-reported assessments should be evaluated. A limited statistical analysis only, is possible due to the small sample size of the individual courses, ranging from 4 to 8/9 participants, and the overall populations attending one or more subject day sessions. The total number of trainees involved were 23, 12 and 32 on the 1987/88, 88/89 and 89/90 training courses respectively.

A possible procedure with a larger target population would be to use the SPSS program (Statistical Package for the Social Sciences) that is available for a total analysis of the data collected. However the population was too small and the resources unavailable to be able to consider such a complete exercise. Many trends in the data have been established along with possible correlations.Individuals are also responsible for certain sections of activity within the whole process of pig unit production and so their impact upon the whole unit is diluted when considering unit physical performance and its correlation with increased personal confidence and ability. A number of areas of objective data have been chosen and it was hoped to relate one if not all of these areas with the self-assessment ratings. The main objective of training courses is to increase knowledge, skills and attitudes which should express itself in improved unit physical and financial performance.

6.2. The Correlation between Self-report Data and Unit Physical Performance

The physical data was totally objective and derived from the pig unit records and the self-ratings were entirely subjective with only some limited guidance for its completion given by the researcher or tutor. The items to be rated were skills, attitudes and areas of knowledge that were part of the training course and also part of every pigperson's job whether specifically related to certain sections of the unit or just general duties. They were requested to rate the knowledge, skills and attitudes on a scale of zero to five. There was a category for "no experience" in the case of skills assessments - "before the course". The trainees scored their ability and confidence for the subject days and the percentage increases in knowledge, skills and attitudes were then tested to see if they correlated with the unit physical performance. The subject days, as noted earlier, were related to unit efficiency factors which were physical and within the stockperson's control, Figure 58.

The correlation coefficient used was Spearman's Rank Correlation Coefficient as it took into account the non-linear relationship between the two items tested. This was also the coefficient used to great effect in the previous study by Girdler (1984) when a similar set of data did not follow a normal distribution. The coefficient also takes into account zero scores.

The researcher completed the testing of rank correlations between physical data and self-rated confidence and ability levels in the areas of knowledge, skills and attitudes.

(a) Pigs reared per sow per year

Table 13. Rank Correlations of Changes in Level of Pigs Reared per sow per year with Self-Rating of Knowledge, Skills and Attitudes Increases

		Knowledge	Skills	Attitudes
1987/88 Training Course (Group 1)				
(a)	(87-88)	0.30	0.12	0.27
(b)	(86-88)	0.39	0.51	0.40
1988/89 Training Course (Group 2)				
(a)	(88-89)	0.33	0.18	0.68*
(b)	(87-89)	0.35	0.73*	0.47
1989 Training Course (Group 3)				
(a)	(89-90)	0.27	0.14	0.06
(b)	(88-90)	0.40	0.55*	0.31

(a) The coefficient relates to the change in level of pigs reared/sow/year over a one year period.

(b) The coefficient relates to the change in level of pigs reared/sow/year over a two year period.

* The coefficient Γ_{-} was significant at the 5% level.

None of the correlations showed any high level of significance with 1989/90 course reaching 5% significance in knowledge and skills, Table 13. The 1988/89 course was close in the skills category. There were positive and negative variations in unit performance data whereas the self-ratings were all scoring positive. The author decided to pursue the other two efficiency factors to establish a possible link between the subjective and objective data collected.

(b) Piglet Mortality - percentage

Table 14. Rank Correlations of Change in Percentage Pig Mortality with Self-Ratings of Knowledge,Skills and Attitude Increases

	Knowledge	Skills	Attitudes
1987/88 course			
(a) (87-88)	0.70*	0.33	0.50
(b) (86-88)	0.48	.0.18	.0.31
1988/89 course			
(a) (88-89)	0.12	0.22	0.65
(b) (87-89)	0.80*	0.92*	0.14
1989/90 course			
(a) (89-90)	0.44	0.33	0.29
(b) (88-90)	0.71*	0.55*	0.40

(a) This coefficient relates to self-reports with physical data change over a one year period.

(b) This coefficient relates to self-reports with physical data change over a two year period.

*The coefficient Γ_s is significant at the 5% level.

Levels of significance were shown to have occurred for all three Training Course Groups, Table 14. The level of coefficients demonstrate a link between the self-reported increases in knowledge and skills, in particular, and the pig unit mortality percentage. The increase in mortality during 1988 and 1989 followed the national trend shown in Table 7 and Figure 34. Adjustments to the recorded physical data to take

account of this fact are very difficult to achieve and so the physical data was ranked using the raw notation.

(c) Litters per sow per year

Table 15. Rank Correlations of Changes in Level of Litters per sow per year with Self-Ratings of Changes in Level of Knowledge, Skills and Attitude Increases

	Knowledge	Skills	Attitudes
1987/88 course			
(a) (87-88)	0.51	0.72*	0.60
(b) (86-88)	0.21	0.35	0.38
1988/89 course			
(a) (88-89)	0.59	0.62	0.48
(b) (87-89)	0.63	0.67*	0.50
1989/90 course			
(a) (89-90)	0.40	0.11	0.18
(b) (88-90)	0.49	0.21	0.11

(a) This coefficient relates to self-reports with physical data change over a one year period.

(b) This coefficient relates to self-reports with physical data change over a two year period.

* The coefficient Γ_s is significant at the 5% level.

Table 15 giving the correlation between the course self-ratings of increased knowledge, skills and attitude shows that the skills element gave a 5% significance level correlation to the efficiency factor of litters per sow per year. All the courses demonstrated limited correlation which may be explained by the fact that the overall responsibility for sow care may not have

been in the hands of the course attenders. Some correlations were significant but there was limited evidence to support a direct link between improvements in unit performance and increased knowledge skills and attitudes.

The researcher decided to look at the correlation between the subject days relevant to unit physical performance, Figure 58, and the self-reported ratings of knowledge, skills and attitude areas. The subject days were related to physical performance data as shown in Figure 58 and shown as (a), (b) and (c) in Table 16.

Table 16. Rank correlations of Subject Days related to Unit Physical Performance with Self-Ratings of Knowledge, Skills and Attitudes

	Knowledge	Skills	Attitudes
(a) Subject Days	0.36	0.47	0.15
(b) Subject Days	0.52	0.74*	0.78*
(c) Subject Days	0.17	0.67*	0.65*

(a) Total Piglets reared per sow per year

(b) Total percentage Pig Mortality

(c) Litters per sow per year

* The coefficient Γ_s is significant at the 5% level.

There was some correlation between the subject days, related to individual unit physical performance and the increase in knowledge, skills and attitudes, self-reported by all course attenders. Large improvements were recorded by individuals which formed a major feature of report in the findings discussed by Girdler (1984). It was more difficult to attribute the positive and negative changes in physical unit

performance to individuals as they worked in a team that was responsible for a certain section within the pig unit.

The range of percentage increases in the three study areas would suggest an exaggerated range of ability within the trainees. Even the training process may have given blanket coverage to given topics to an unidentified target population. The suggestion is that a more homogeneous group is required, i.e. one that has been selected for an individual development programme which should bring benefits to the farming enterprise. Psychological testing can often be used to establish certain abilities and affinities to certain forms of training.

6.3. Psychological Tests - Visual-Spatial Ability Assessment of Experienced Agriculturalists

The premise that training is the solution to the problems found on any farm assumes that the people, who will be trained, are "trainable". Research work suggests that the trainability of people, especially adult experienced staff, varies according to their natural intelligence, previous education to date and the style and content of any training experience, Baldwin (1922) and Bayley (1970).

This means that employers/farmers find themselves having to predict the future performance of their present and potential staff. They may want to know which of their current staff are most likely to succeed on a further training course, or in a new and more demanding role on the farm.
Such predictions are difficult since a full range of tasks with which the employee is likely to be faced cannot easily be specified. People are increasingly being asked to master a

range of tasks (multi-skilled). The rapid advances being seen in many work places mean that there is also an increased need for employees who have the capacity to acquire new skills and adapt quickly to new working demands. All these considerations mean that people must be identified who have the general intellectual attributes required to cope with variable work demands, Cattell (1973). Many jobs simply need people who can think logically or can learn quickly and easily. One way of measuring these attributes would be to look at past academic achievements. This, however, may only reflect good or poor motivation rather than inherent ability. General Ability Tests have been developed to provide an indication of the extent to which a person possesses the required general intellectual attributes for the job.

The spatial test was trialled with pigpeople who were experienced agriculturalists. The abilities that were being assessed focus down into three main areas:

(a) Spatial relations or rotation - mental rotation.

(b) Spatial orientation - judgements on how it could look.

(c) Visualisation - mental manipulation of complex stimuli, Lohman (1979).

Further work by a number of prominent psychologists has lead to the general conclusion that more able individuals are better able to create rapidly an accurate and stable internal representation of the stimulus, which then enables rapid and error-free transformation and comparison processes, Pellegrino, Mumaw and Shute (1988). The test was based on test details available from the "International Directory of Spatial Tests" by Eliot and Mcfarlane Smith (1983) and trialled

successfully before becoming available for trained psychologists to use.

The 1987/88 Training Course Group and Control Group were requested to complete some psychological tests which were designed to indicate their intelligence quotient level in the visual-spatial area of ability. They were the same people asked to make self-report assessments in Chapter 5. This is an important area of ability for pig stockpeople as opposed to numerical and verbal ability, due to the visual nature of livestock-keeping. The knowledge, skill and attitude of the person looking after the stock must be focussed on the animals within particular surroundings so that anything which is not "normal" behaviour can be spotted and dealt with accordingly. Some concepts of this work are related in Seabrook (1987, 1988).

The author used two tests, one of which was based on a commercial package available from NFER Nelson (1988) organisation. Both were used to test the visual-spatial senses and had nothing to do with Agriculture either in their design or comparability.

(a) Spatial relations or rotation

The trainees were asked to sort out various diagrams which assessed spatial relations or rotations as reviewed in Cronbach (1984). Spatial tests have played a large part in research by vocational aptitude. Space relation tests are a measure of ability to deal with concrete materials through visualisation. There are many vocations in which one is required to imagine how a specified object would appear if rotated in a given way. The images of objects and places have

visual detail; we see things in our "mind's eye", Corballis (1988). Moreover as Miller (1975) suggests that humans are capable of performing mental operations on those images that are analogous to the operations one carries out on our perception (images have some of the visual details of perceptions), e.g. mental rotation. The pigpeople were asked if the figure was normal or backward, Cooper and Shepard (1973). The more that the figure is rotated then the longer it may take to make a decision. This finding suggested that the people made their decisions by mentally rotating the image of the object until it was vertical and then checking whether it was normal or backward. People can manipulate images in their mind and so demonstrate visual thinking which has been fostered by mental rotation.

These visual-spatial tests and their complementary, verbal and non-verbal tests can be aptitude tests which are intended to predict success in some occupation or training. There are also ability tests and achievement tests which will be discussed later within the whole area of trainability. The distinction between an aptitude test and an achievement test is not based on the content of the items but on the purpose of the two kinds of test. An aptitude test is attempting to predict future performance. The items tested must consist of samples of what can be achieved now. How can one construct anything other than an achievement test?

It is difficult but certain principles may contribute to a certain profession/job/activity so the people performing these activities may/must use these principles, e.g.hand-eye

co-ordination in detecting illness in pigs. If this hand-eye co-ordination test predicts pigperson success more readily than a spatial orientation test, then it will be weighted more heavily towards a final score. A person may have an aptitude in a particular capacity to perform certain groups of tasks. It is only fruitful to consider such groups of tasks which demonstrably require a common capacity. Use of the term, e.g. stockperson aptitude suggests a special capacity required for stockpersonship tasks. Evidence, however, is rather pointing towards there being very little commonality between these stock tasks and that capacities required for them may be equally necessary for some non-stockperson tasks. A stockperson aptitude may include tasks such as verbal, numerical, spatial (or ability to judge and manipulate shapes and sizes), mechanical, manual dexterity and clerical aptitude.

(b) Spatial Orientation

The spatial aptitude involves the ability to judge and manipulate shapes as size is crucial to all freehand drawing and important in a range of practical occupations. General intelligence plays a part in potential success within an industry/employment, e.g. pigperson, but in addition there is evidence of special aptitude. Cronbach (1984) also mentions the spatial orientation aptitude to manipulate "things" mentally to create a structure in one's mind from a plan. The NFER Nelson test used by the researcher involved the pigperson in imagining a 2 dimensional plan as a 3 dimensional image, Figure 63. It is an aptitude needed in such fields as drafting, art, die-making and decorating wherever there is a need to visualise objects in three dimensions. The applicability of these tests to pig/stockpeople centres around

the requirement for them to recognise changes in the pigs within a group. This may be a pig that is unwell and/or one that is unfit to send to market. This test is intended to predict success in some occupation and an ability test is one on which the person cannot earn a better score than they deserve. The takers of the test are encouraged to earn the best score they can. Spatial ability is not easily distinguished from fluid ability. This latter ability is a short label for apprehending an unfamiliar configuration and re-arranging it to satisfy some requirement. This is an adaptive process. Block design, embedded figures, matrices and scrambled sentences have a marked spatial element but the assessment does require a "vocabulary" of common forms and is looked upon as an impurity.

(c) Visualisation

Good performance might reflect ability to operate with images as distinct from symbols, Cooper and Shepard (1973), but many subjects encode graphic displays in words and solve the problems in that translated form. This is where spatial tests overlap tests of abstract reasoning. Spatial abilities are not strongly differentiated but many distinguish visualisation from spatial orientation, Lohman (1979) and McGee (1979). Visualisation has to do with an analysis of relatively complex forms. Spatial tests, e.g. General Ability Test Battery (GATB) and Differential Ability Test (DAT), form perception GATB, paper folding and block design are all in this cluster of tests. The second factor is a changing scene prepared through a TV or computer screen and the person's ability to comprehend the alterations. The third factor is tied to speed of comparatively simple judgements about rotation. This ability

is more than general reasoning; one sign is that, during adolescence, males pull ahead of females on all types of spatial tasks, McGee (1979). However within sexes difference is at least as large as between sexes. Cultural and educational experience affects spatial performance. More analytical studies of the processing of spatial information are needed, combined with experimental tests to make specific processes more efficient. This would give an insight into how spatial abilities are achieved.

A number of jobs depend on spatial ability at least as much as general ability, e.g. correspondence between ability and performance can be a coefficient of 0.7 for watch makers. Occupations can be predicted by spatial scores. Spatial ability alone rarely accounts for success but taking aptitudes into account simultaneously improves employment decisions.

The ability tests meàsure general ability or intelligence, special abilities, interests and motivation and personality. A good test, according to Miller (1975), is objective i.e. responses can be reduced to scores, reliable i.e. within reasonable error levels, and valid. The validity, in an industrial sense, is the match between scores on a test and the performance on the job. The problem is whether one means overall general performance or certain elements of performance. The test results can be used to predict, compare and understand in the following ways:

1. If a single or total score increases then the more effective the person will be in their job subject to the fact that if the person is too good then they would become bored and inefficient and leave fairly soon.

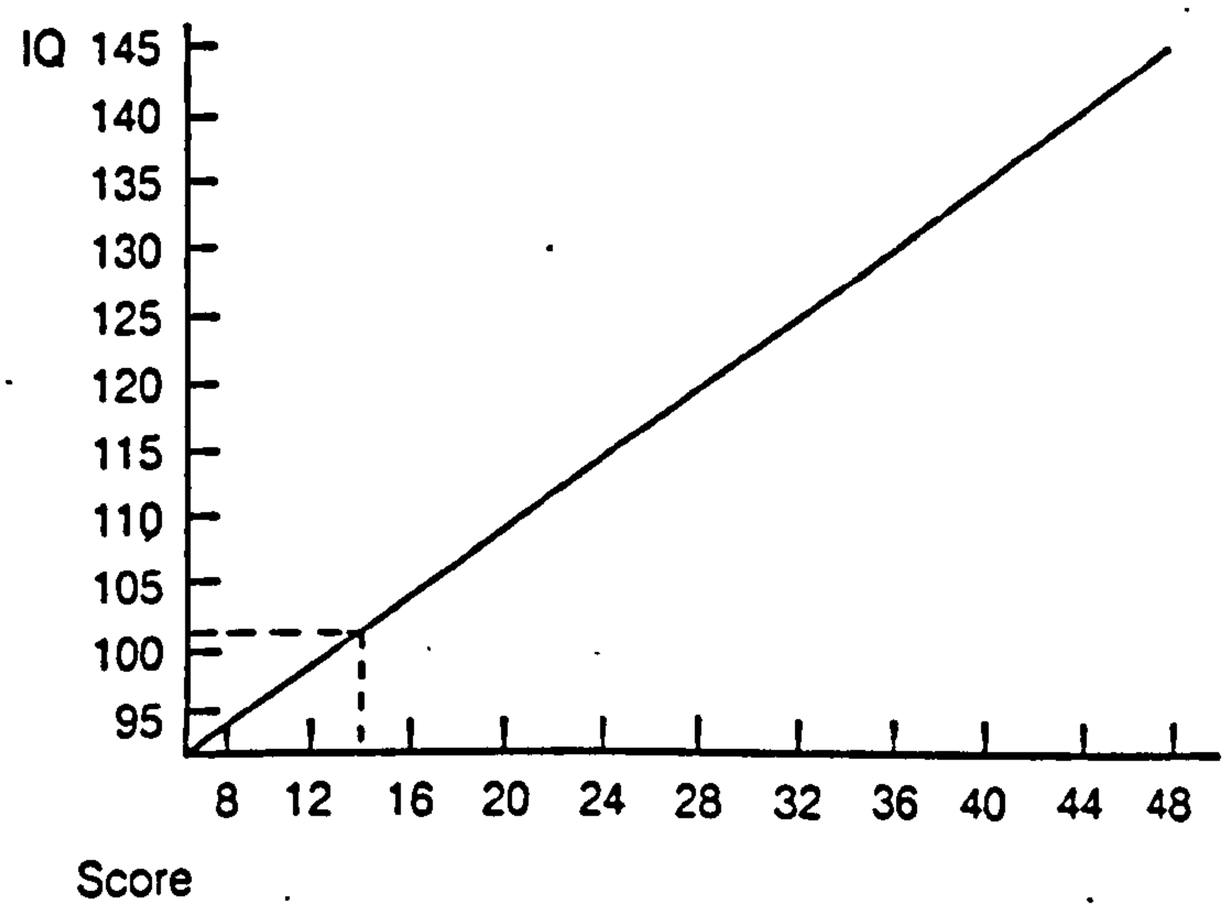
2. The short time involved in answering the test will give a lot of information which the researcher can compare with others.

3. The test results will help to show why a person may be under-performing.

6.3.1. Participant Scores - Total score and I.Q. level

The results for the visual-spatial tests were converted by the researcher into total scores, Figure 59.

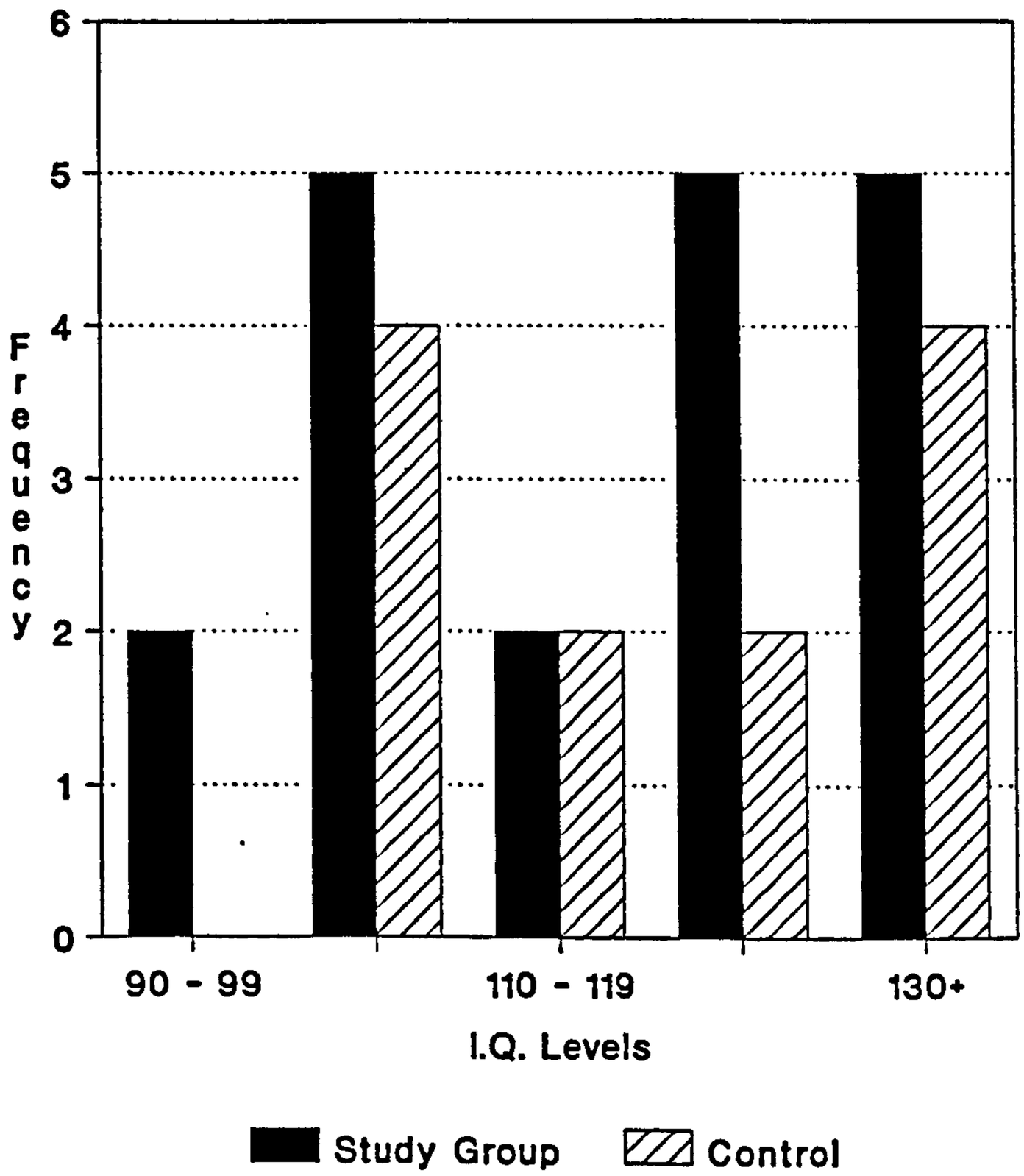
Figure 59 . Visual-Spatial Ability Score



I.Q. = Intelligence Quotient Source: De Carlo (1984)

Using the linear relationship provided by the test designers, the total scores were changed into Intelligence Quotients and the frequency shown in Figure 60. The data is then in a format that can be used to compare with professions, primarily in the United States of America, where much of this work has been carried out.

Figure 60. Intelligence Quotients and their Distribution with 1987/88 Training Group and Control Group



There were a high number of trained stockpeople whose scores showed a high level of visual-spatial ability. The United States of America data gave the following comparative professions:

Table 17. Average I.Q's of Various Professions in United States of America

Conceptual Professions	I.Q.
Lawyers Teachers Chemists	120-128
Skilled Manual Trades	
Craftsmen	112
Electricians	109
Welders	104
Unskilled Manual Work	
Painters/decorators	98
Truck drivers	96
Foresters	95
FARMERS	91
Miners	91

Source: De Carlo (1984)

The Table 17 indicates that the 1987/88 Training Group and Control Group staff should at least come into the craftsman section as opposed to the "unskilled manual level" of 91 (probably illiterate Mexican migrant workers in Southern United States of America). Most of the trainees had a very high visual-spatial ability apart from a few who may or may not be trainable within the pig industry in the long term. The high levels of ability recorded would need to be added to further tests of ability and achievement (verbal and non-verbal and mechanical ability) to determine the trainability of these individuals.

There are two main points to be considered from this data. The first point is the large difference between the data collected and the comparative material. The second point concerns the breakdown of the scores into the various components of the

tests themselves. Starting with the first test the instructions were:

"You have thirty minutes to solve the problems. The score is equal to the number of correct answers you get within the time limit without looking up the answers. Do not spend too long on any one problem. Go back if you have time at the end".

6.3.2. Participant Scores - the Level and Breakdown

An assessment of the total correct answers shows that the percentage of correct answers varied from 86% to 14% for the 1987/88 Training Course Group and 76% to 28% for the Control Group. Some typical answer profiles are noted below and provide evidence for a closer look at the test items and responses.

Table 18. A Breakdown of Some Individual Answer Sheets

	1987 Training Course Group					Control Group				
Trainee	1	2	3	4	5	1	2	3	4	5
% Correct	86	78	66	20	16	76	70	66	41	28
% Wrong	6	22	34	80	36	16	30	23	59	66
% not attempted	8	-	-	-	48	8	-	11	-	6
	100	100	100	100	100	100	100	100	100	100

The breakdown of answers to the set problems demonstrated the range of visual-spatial ability and raised the question over the unattempted questions, Table 18. The type of problem must also be investigated to see if there are any suggestions concerning inability to answer correctly a certain type of

question. The first visual-spatial test paper used in this study was concentrated around two formats:

1. "Find the one that does not belong" from a set of figures that are altered in a rotational sequence.

2. "Insert the missing figure" from a series of alternatives to fit the pattern "A is to B as X is to ?"

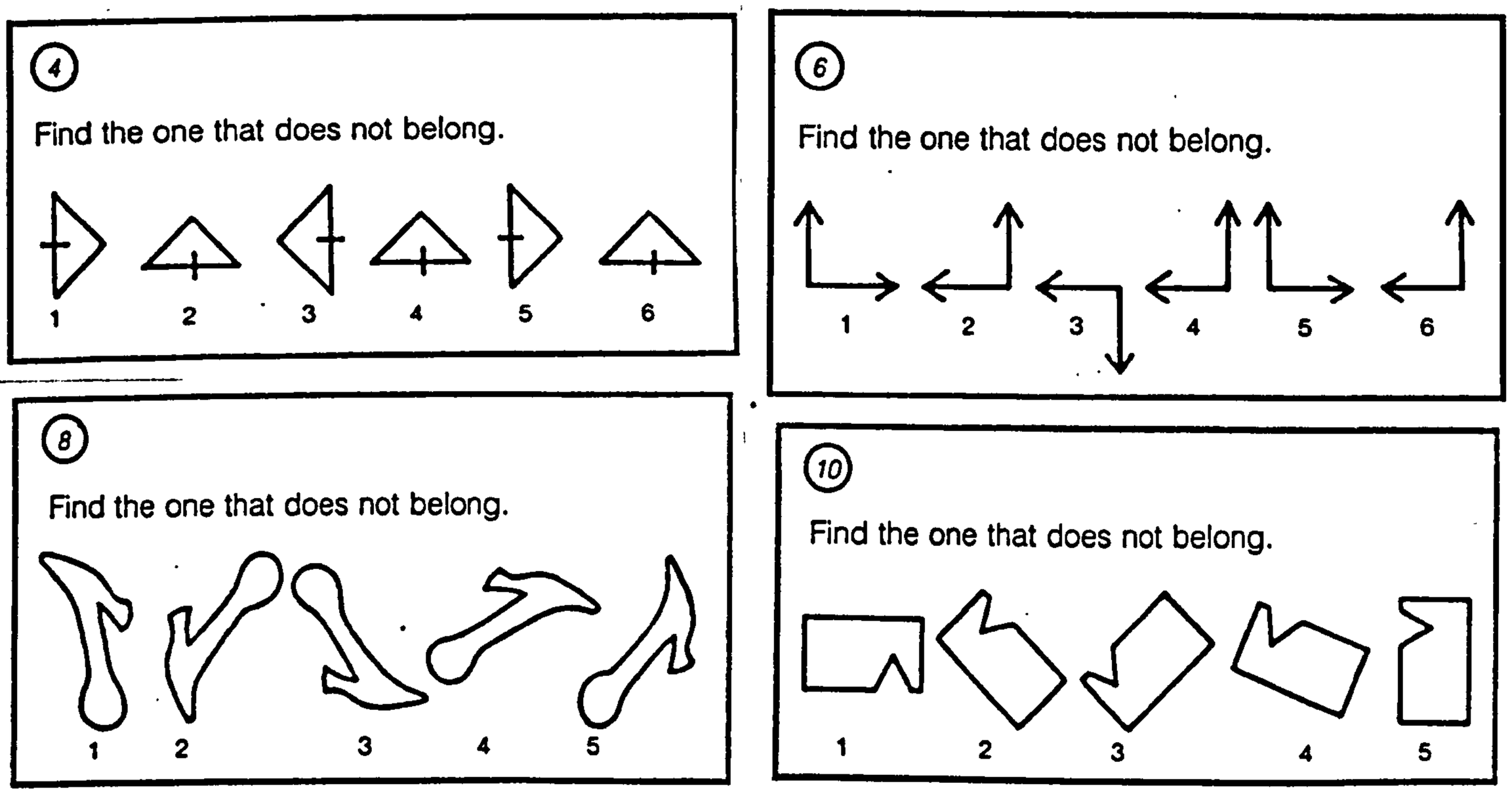
The concentration by the researcher to investigate the visual-spatial ability means that other abilities have not been researched to give a balanced overall I.Q. for a trainee. This may result in a skewed distribution for the I.Q. assessments compared with the American work shown in Table 17. The populations may not be very similar in age, ethnic background and previous education and training. However the two populations (study and comparative group) have achieved very good scores and show a high degree of visual-spatial ability.

6.3.3. Problem Scores - the Level and Breakdown

Very poor levels of correct answers were achieved for some of the set problems and high levels of unattempted answers were shown for other questions. This would lead one to ask the following questions:

Why are there anomalies in the results for certain problems? Does the time factor affect the level of correct answers? How accurately do these scores reflect a person's ability and effectiveness in the business?

Figure 61. Visual-Spatial Ability Problem Examples



Source: De Carlo (1984)

The 1987/88 Training Course Group gave the following results, Table 19, for the above question in Figure 61.

Table 19. % Correct Answers for Problems in Figure 61.

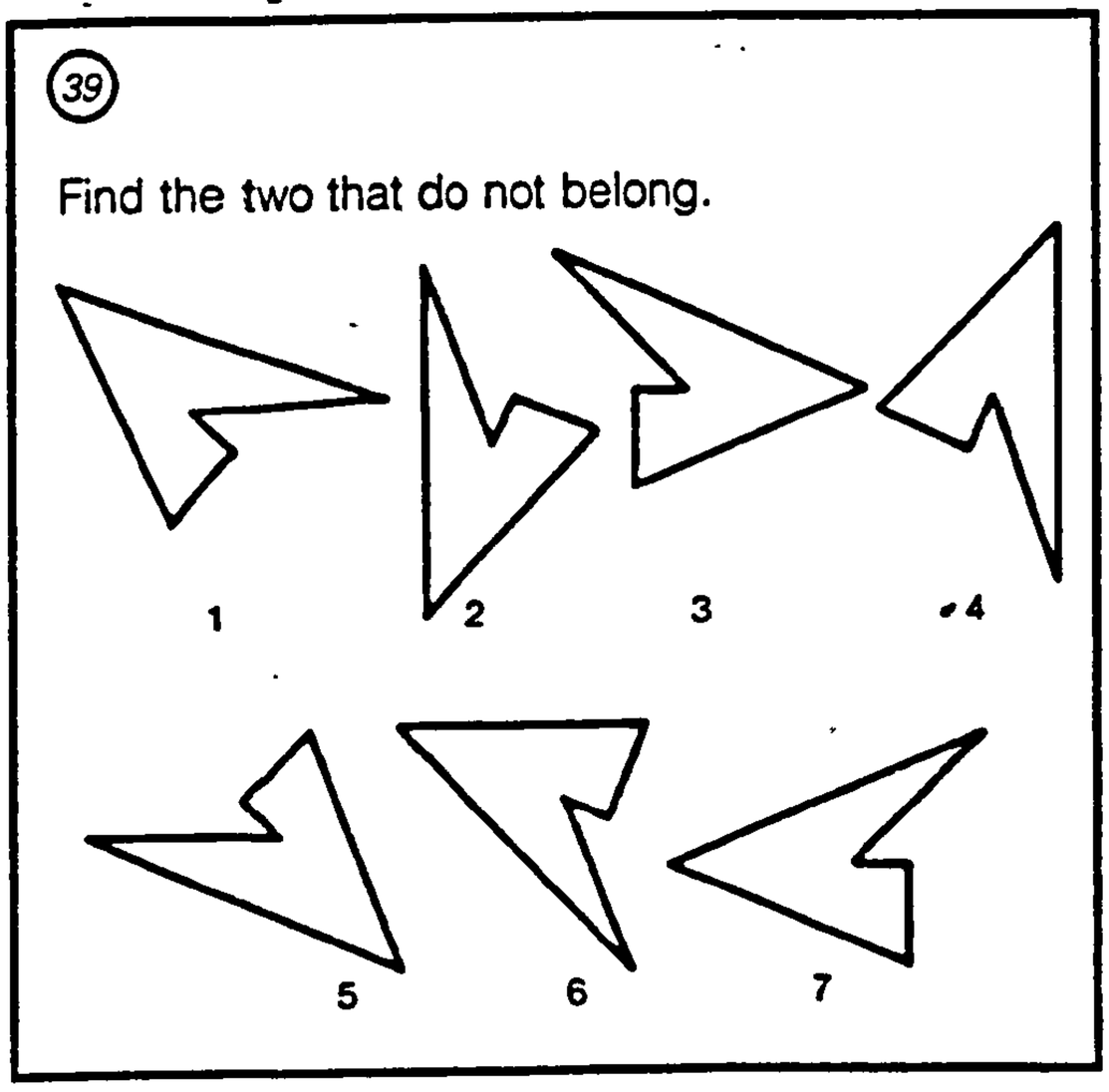
Problem	4	6	8	10
	%	%	%	%
1987/88 Training Course Group	6	6	81	70
Control Group	25	12	70	72

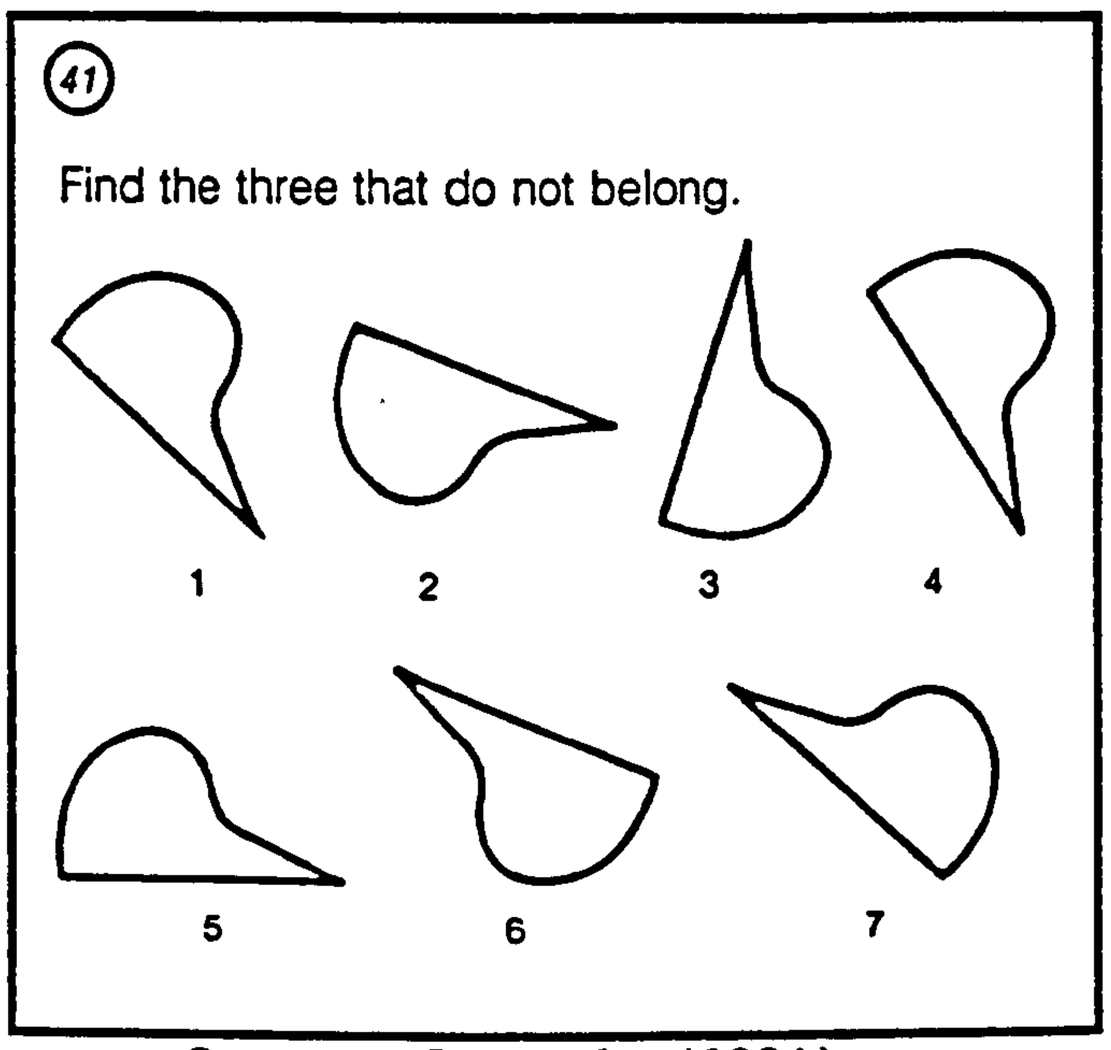
They all involved rotational problems and yet the results were very different. The latter two questions do involve more recognisable irregular shapes rather than the triangles and direction keys.

The Control Group scored a similar pattern of ability to the Training Course Group. The shapes, problems 8 and 10 seem to be easier to rotate mentally and so establish "the one that does not belong" to the set. Low "correct answer" scores were

attributed to further questions with more regular shapes, e.g. circular figures, squares and triangles. Irregular rotated shapes scored high marks for both sets of participants, i.e. study and comparative groups, Figure 62.

Figure 62. Further Visual-Spatial Problems





Source: De Carlo (1984)

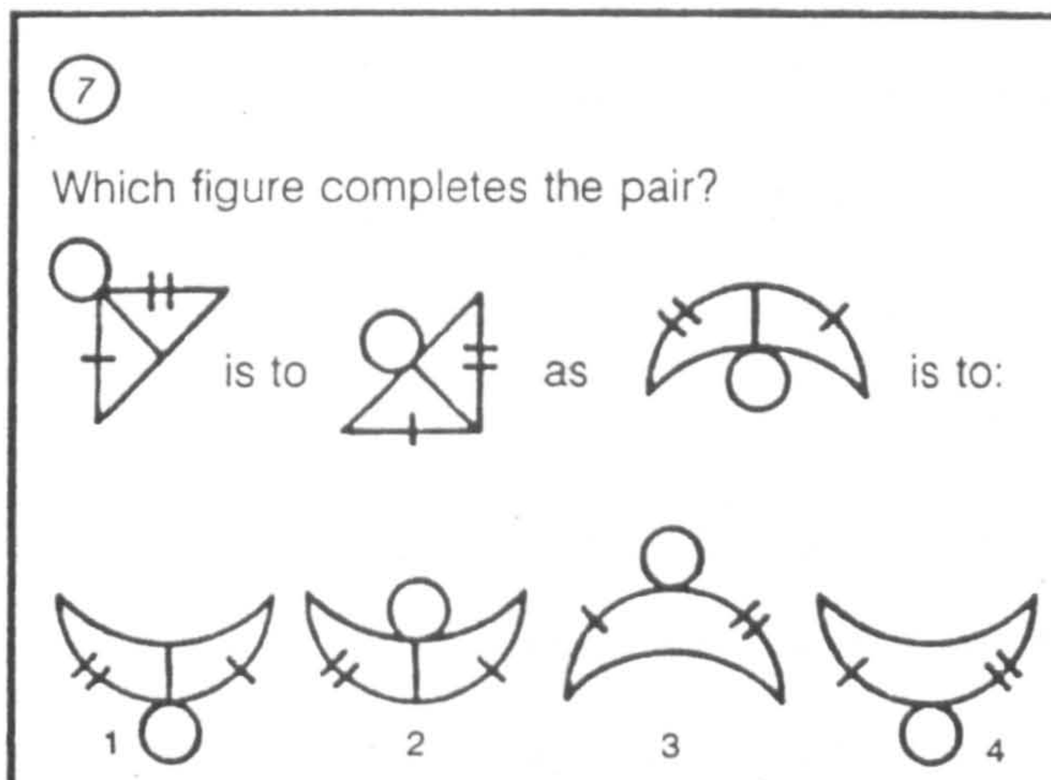
Even when more than one shape did not belong, the correct scores were all above 70% with one question again at 80% for these irregular shapes. This was true for both groups tested in this study, Table 20.

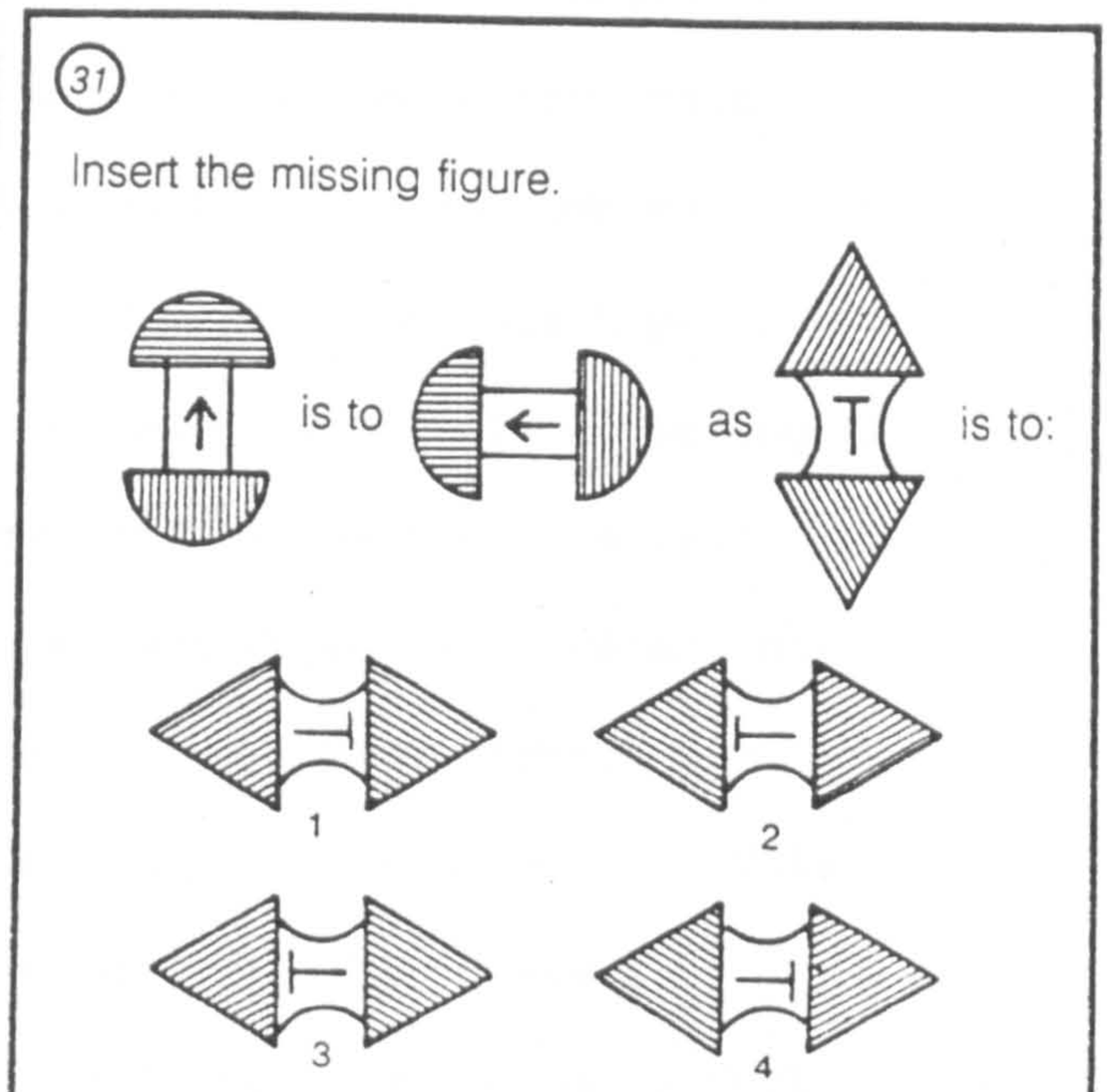
Table 20. % Correct Answers for Problems in Figure 62

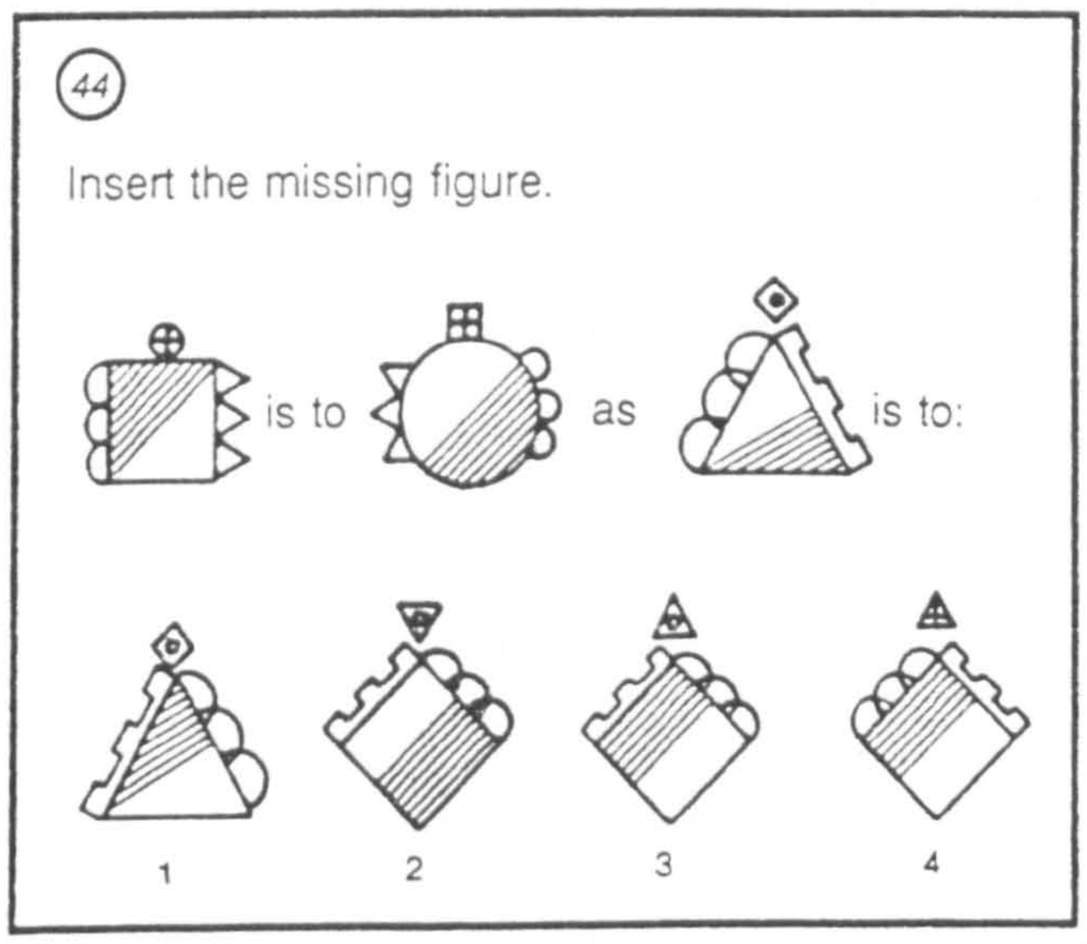
Problem	39	41
	%	%
1987/88 Training Course Group	75	71
Control Group	68	70

The second type of question in the visual-spatial ability test was of the type that stated "X is to Y as Z is to ?". Some examples are shown in Figure 63.

Figure 63. Visual-Spatial Problems







Source: De Carlo (1984)

The percentage scores for correct answers to the problems shown above are shown in Table 21.

Table 21. % Correct Answers for the Problems in Figure 63

Problem	7	31	44
	%	%	%
1987/88 Training Course Group	31	9	10
Control Group	0	12	21

There was an inherently low ability to be able to compare one shape with another and make a judgement as to what the missing figure should be, when given various alternatives, Table 21.

This could have been due to guesswork as the time began to run out for completion of the whole test. It could also point towards a lack of ability to cope with the more complex situation than a rotating image. Only one of this type of problem scored greater than a 50% success rate in detecting the missing figure out of the seven used in the test. A criticism of the test was expressed by one participant who stated that "the figures should all have been either farm animals or machinery or at least something associated with work". This, however, would have created the potential for a skewed distribution of results due to familiarity with the subject area. The researcher was attempting to detect the level of visual-spatial ability, which is an important attribute for good stockpersonship, rather than the potential to find the cow with three legs in a group of cows as one of the test problems.

6.3.4. Problem Scores - the Level of Unattempted Problems

Another aspect of this test centred around the number of unattempted problems. There were some staff who did not attempt to answer large numbers of the problems set. This may have been due to the time allowed or the inability to detect the missing one or the one that did not belong.

For the 1987/88 Training Course Group there were eleven out of nineteen pigpeople who did not attempt one or more of the problems. Seven people did not try between 2 and 4 questions, i.e. 4-8%. The remaining four people left 7, 10, 13 and 24 problems unanswered, i.e. 14, 20, 26 and 48%. The participant who left nearly half the problems unanswered was a confident person on the unit, i.e. self-assessed as "good to excellent", for knowledge, skills and attitude,whose performance was not

considered to be so good by his unit manager. He has since left agriculture for alternative employment. The pigperson who left 26% unanswered was a unit head stockperson. He did achieve a 92% success rate on the answered problems. This would tend perhaps to indicate that he spent more time on the problems than he had been allowed by the tester - especially as he did not attempt the last five questions.

For the Control Group, five out of the twelve people tested left between 2 and 8 questions unanswered, i.e. 4 to 16%. Both the staff with around 16% stated to the researcher after the test that they just could not sort out the correct answer and were not prepared to guess. This level of honesty could be to the advantage and the detriment of the pig unit. The advantage would mean that these pigpeople may have trouble detecting a problem in the pigs but would not treat them all and waste money. However, they may leave the animals and some may die overnight or whenever. There were pigpeople in this group who only scored less than 30% correct answers which reflected in the final I.Q. scores shown in Figure 59. The other pigpeople who left 3 or 4 questions just ran out of time to try some and return to others.

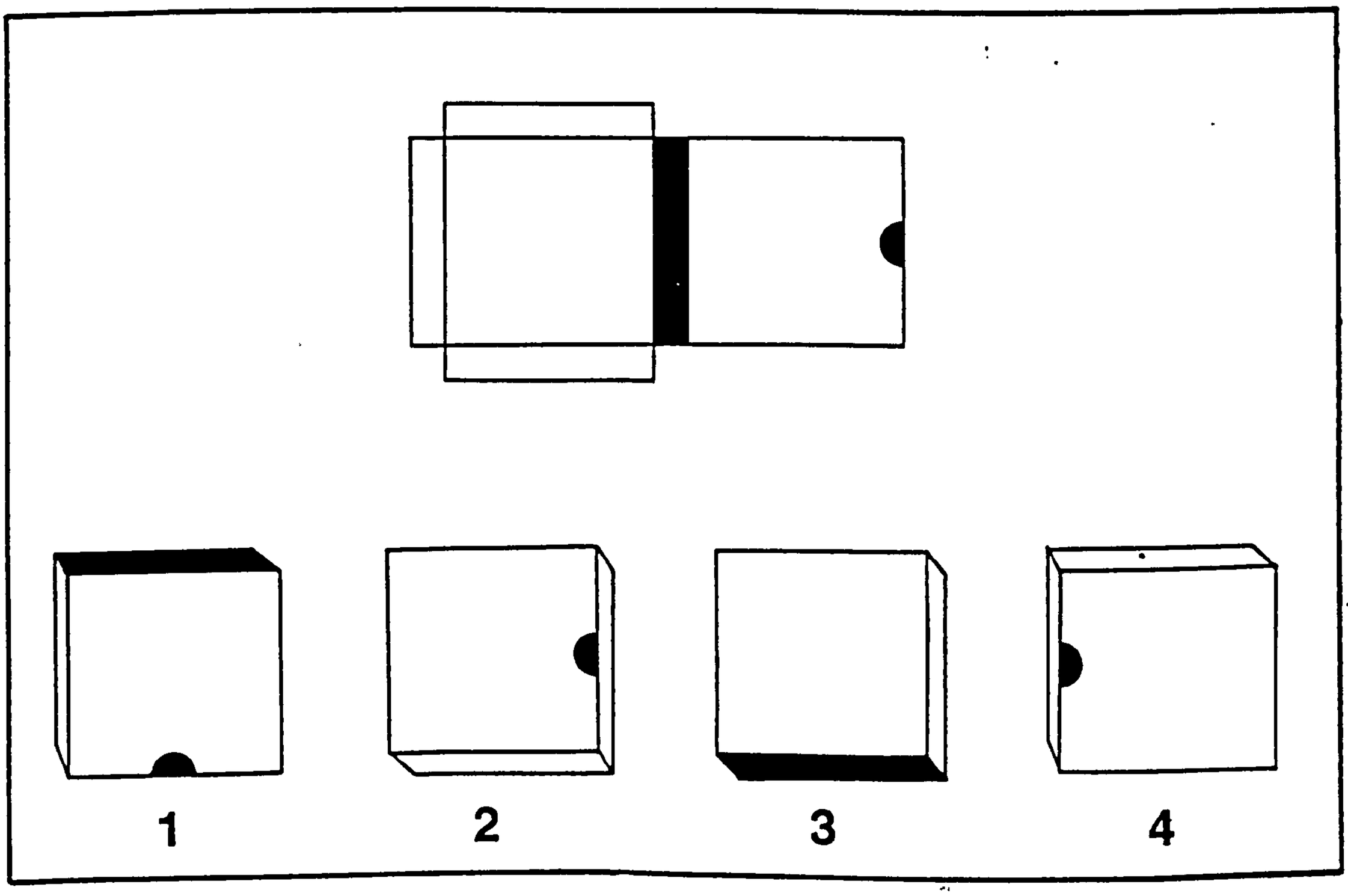
The next stage in the investigation was to look at the level of unattempted answers for the individual problem areas. Taking the study group first, the problems with the highest level of "not attempted" were numbers 4, 11, 17 (all rotational problems), 31, 35, 36, 38 and 44 (all "A is to B as C is to ?" problems), Appendix G. The percentage of participants who did not try the questions ranged from 20-30% with a mean and median of 27%. These results, once again point towards the

participants either being unable to answer these problems or they ran out of time to attempt them or to return to them for reconsideration.

6.3.5. Visual-Spatial Ability Test - a second type of test

The researcher also used a NFER-Nelson package, an example of which is shown in Figure 64. The participants are requested to create in their mind a three dimensional object from a two dimensional drawing and then compare this 3-D object with the examples shown. There may be more than one correct picture to choose from, in each set-problem.

Figure 64. Visual-Spatial Ability Test Example



Source: NFER-Nelson (1989)

Only six out of the nineteen pigpeople in the 1987/88 Training Course Group Group were given this ability test along with six

from the Control Group. The overall % correct total test scores for each person are shown in Table 22.

Table 22. Total Test Scores as a % Correct Answers for Individuals in Comparative Groups

Number of Individuals from each Group	1987/88 Training Course (Group 1)	Control Group
	%	%
1	48	42
2	48	56
3	60	70
4	80	30
5	66	82
6	76	42
	—	—
Average	63	54
	—	—

The first individual from the Training Course Group was a very self-confident person who scored himself very high for knowledge, skills and attitudes in other tests. He did not prove to have a high level of visual-spatial ability and his unit manager commented that he was confident in his own ability but his performance at work was only average compared to others on the unit. The second low scoring pigperson was tested to have limited ability in knowledge and skills areas as well as visual spatial aptitude (he had not achieved his craftsman level after two attempts). The other four people who were tested, had high levels of visual-spatial ability which matched up with their position of responsibility on the unit and also the reports from their unit managers. The six Control Group individuals were not so good at this test as the Training Course Group. Only three people managed to score over half

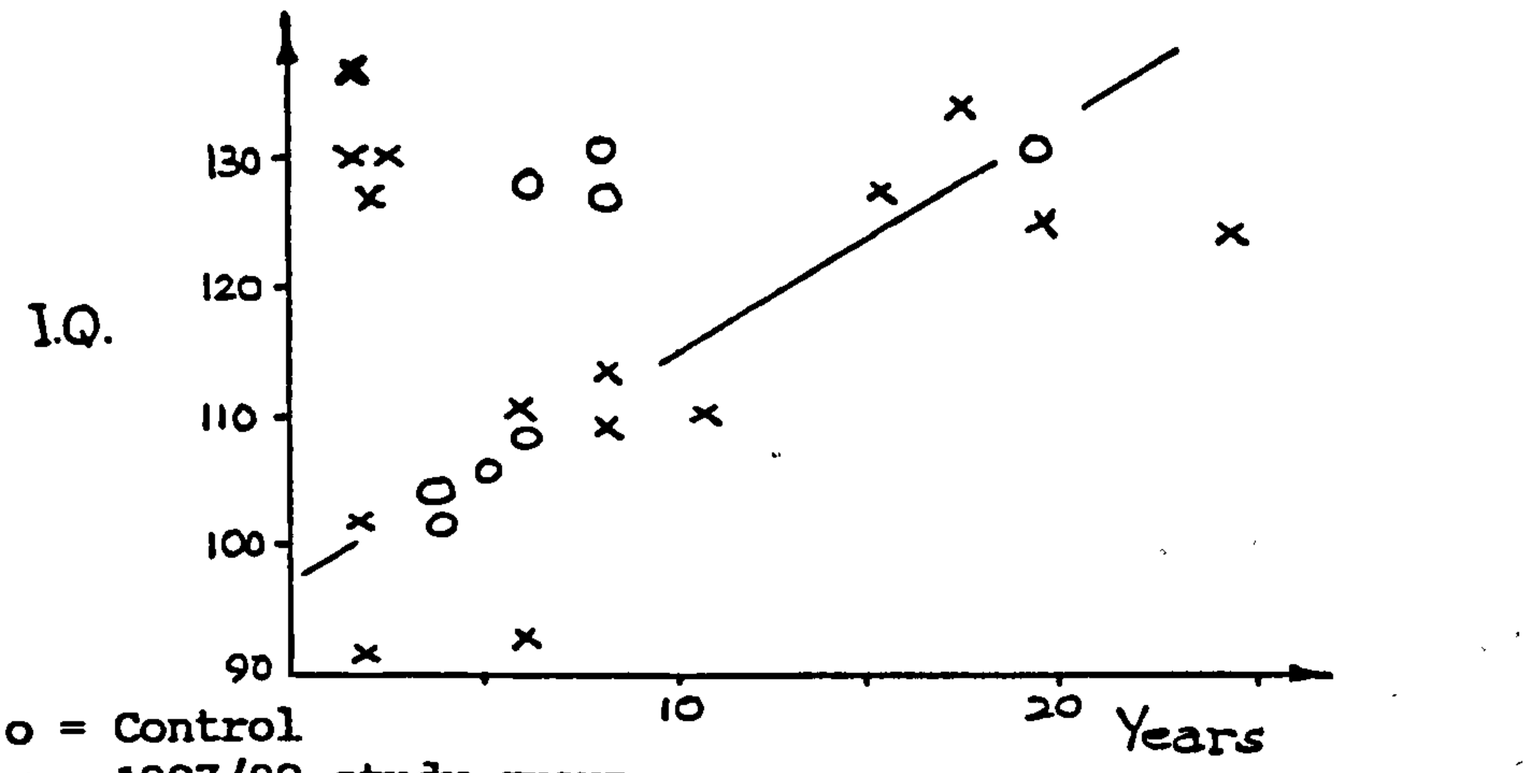
correct. Once again there were individuals who were confident concerning their ability as stockpeople and yet achieved poor scores, e.g. individuals 1 and 6 in Control Group. The test, itself, had ten different shapes that had to be constructed mentally into four 3-D figures and compared to the answers given, Figure 63 and Appendix G. Five of the problems scored 50% or under for selection of the correct 3-D figure that represented the 2-D drawing shown at the top of the exercise, Figure 64. Four exercises scored 44% and one exercise 38% of answers correct. The whole test should take only twenty minutes and it was difficult to categorically state that a 3-D picture was not attempted/answered because only the correct figures should be circled. Two of the figures used squares, one was a triangle and the remainder were irregular shapes. There did not seem to be a pattern for the low scoring questions.

To summarise the section on problem scores, it would appear that anomalies in results do occur due to the ability of the respondents as a result of experience, age and often cultural background. The time factor for the adults taking these tests would also result in people not answering questions (no attempt), guessing and being unable to return to missed answers. Whether the scores reflect the ability and effectiveness of staff on their units will be discussed further.

6.3.6. Do the Scores Recorded by the Visual-Spatial Tests Reflect Effectiveness on the Pig Unit?

The research by the author may indicate that high scores relate to high levels of experience and years within the industry apart from some notable exceptions, Figure 65.

Figure 65. Visual Spatial Scores Related to Experience on the Farm



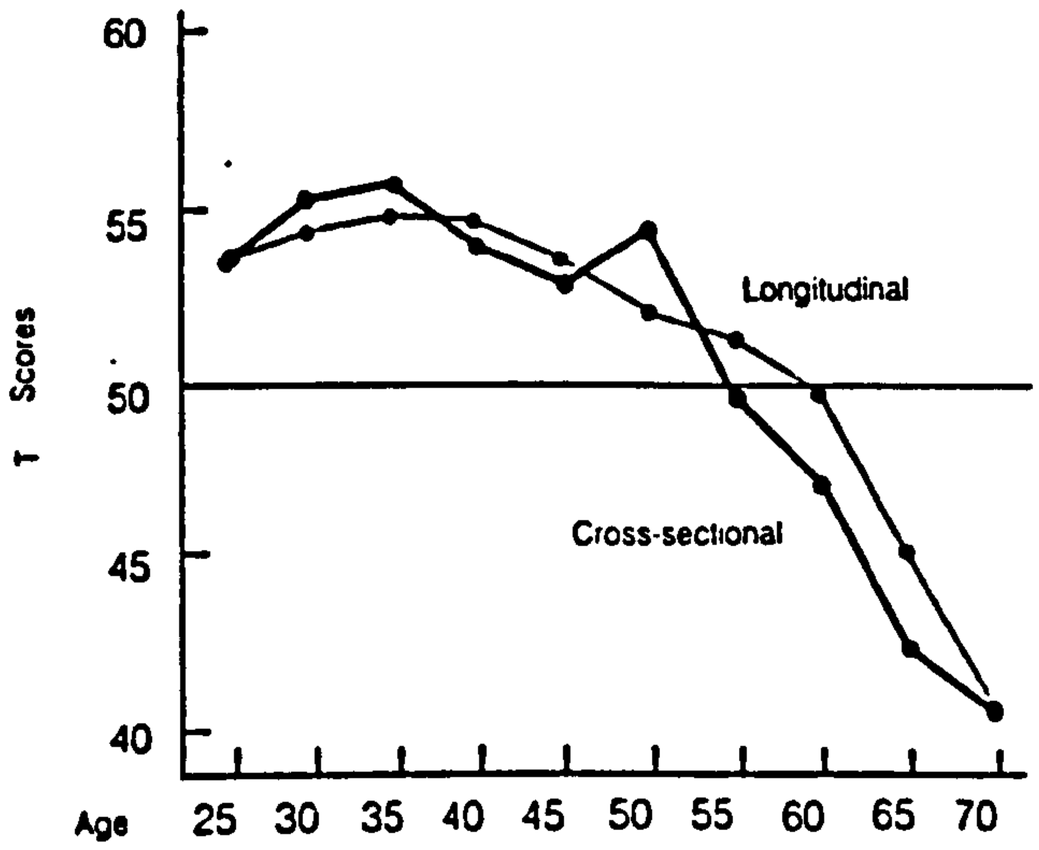
There were four trainees who had less than 4 years experience with scores in excess of I.Q. 125. This would tend to indicate high levels of inherent ability that should be capitalised upon by the management of each unit and they should be working in sections of the unit where their knowledge, skills and attitudes can be put to the best effect. The confidence assessments, with regard to knowledge, skills and attitudes, increased quite substantially for these trainees with levels of +20% to +80% being recorded at the end of the training period. It would be very difficult to attribute any improvements in herd physical performance to these individuals but they must have helped in their various situations. The above observations fit in with the graphs and work set out by Anastasi (1964, 1982) in Figure 65. These were:

(a) Performance on intelligence tests tends to stabilise at the highest level in the late teens and twenties for individuals.

(b) As people get older, their performance in certain areas changes. If speed of response is important then younger people can demonstrate their dexterity and older people their wisdom when tested using longer time spans, Schaie and Strother

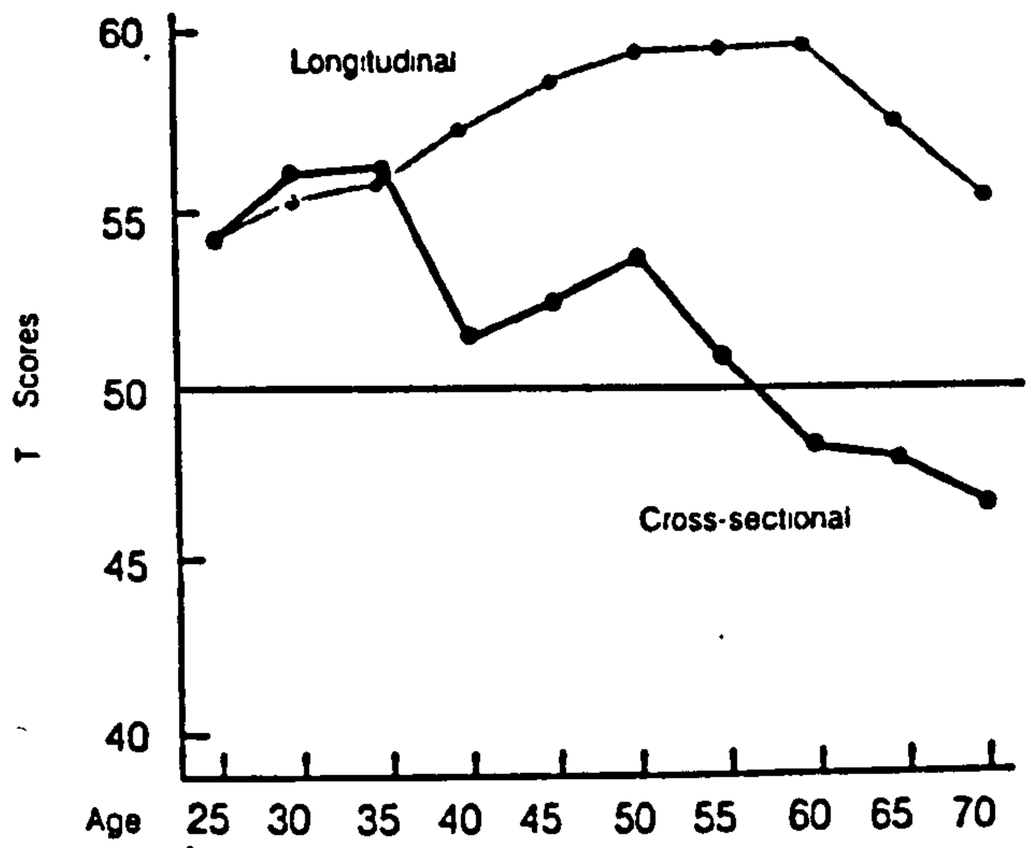
(1968). Does this prove superiority of the young and indicate the elderly are unfit for positions of responsibility? Not at all!

Figure 66. Changes in Intellectual Ability Due to Age.



Changes in Intellectual Ability Due to Age

The scores are based on the results of a battery of tests in the five primary abilities. The battery is particularly weighted with tests of speed like the verbal fluency test. Both the longitudinal and cross-sectional data indicate that the peak of one's abilities is reached at about 35 years of age and drops rapidly after 50. The scores are expressed in units of standard deviation with an average of 50 and a standard deviation of 10. The average of 50 is based on a sample of 1000 adult subjects.



Changes Due to Age

The above graph is based on a combination of the scores from verbal comprehension and reasoning tests, neither of which involve a speed factor. Here, the cross-sectional and longitudinal data show markedly different results: The cross-sectional data indicates the peak is reached at age 35, whereas the longitudinal data shows the peak at 60.

Source: Anastasi (1982)

The decline in scores on certain intelligence tests does not mean that adults of middle years and beyond are less able to carry out their roles on the farm or pig unit. Although new experiences are assimilated less quickly, much that is learned in the past is not forgotten. If one considers wisdom to be the accumulation of past experiences and intelligence to be the ability to apply that wisdom to current problems, one can understand how an older person can be more competent than someone younger who is faster perhaps, but lacks the other's experience. Intelligence tests place inordinate weight on items requiring ingenuity, speed and the ability to adapt to new situations, and not enough weight on the equally important accumulation of experience, for it is this that allows older

people to effectively cope with many situations in their professional lives. Despite the many criticisms with the earlier designed tests; bias and a circumscribed context and failure to make room for such factors as diverse cultural, motivation and interests, they can yield useful assessments but not accurate quantitative results. They can be seen as an invasion of privacy for the purpose of gaining information. However it is now generally accepted that the results from the most recently designed tests are primarily useful as guide-lines which help to deepen the understanding of the human personality as much as possible. Tests can be useful as a way of learning about abilities, aptitudes and motivation in the areas in which one now works, or in new areas of work which one might want to consider. Put in this context, the scores shed their "authoritative" character, and can be used to improve individual and collective well-being. In short, they are no longer regarded as invasive instruments but rather as stimuli to self-improvement.

Who can say if a person with a particular score on an IQ test or on a visual-spatial aptitude test will do well in a job, or even in life for that matter? Moreover, it is well-known that common sense, self-control, motivation, ambition and the ability to develop harmonious relationships are determinative in one's success in work. A visual-spatial ability allows an individual to discriminate between shapes and colours, to see relationships between diverse elements and to isolate the essential features of a geometric, plastic or figurative structure (even a pig!) and is very important in a number of professional activities. Studies in perception, which are all

part of this ability, have played an important part in psychological research in general, and many go beyond our area of concern, which is the ability to grasp visual detail, to perceive the similarities and differences between subjects and the relationships between shapes, all part of both the psychological tests reported earlier. Perception is related to the senses themselves (sight, hearing etc) and the sensory data received. The 1987/88 Training Course Group and Control Group have general high visual-spatial ability but there are problems for some of them for certain situations.

Seabrook (1988) has shown that an affinity to the stock as well as the surroundings is all part of the complicated system that gels together to make an efficient or inefficient enterprise on a farm, in this case a pig unit. Each member of staff on that unit is contributing towards a level of efficiency that may reflect the different perceptions, abilities and experiences of those employees and not the manager/employer. The test results for ability, (in the sense of intelligence, aptitude and interest) and increased knowledge, skills and attitudes after training were compared for some trainees, Dunnette (1976). The unit manager's comments and the researcher's general observations are collected in three studies of individuals whose stories lend support to the complex nature of these studies.

6.4. Individual Case Studies

A relatively small sample of individuals have contributed to this research study and the volume of data collected from them and about them has been considerable. There was sufficient to generate three detailed case studies that tends to support the

inferences raised by the analysis of the data collected. The whole area of the effectiveness of the techniques to measure training and human behaviour is very complex. The following studies should give some indication of this effectiveness.

CASE 1

This respondent was one of the trainees on the 1987/88 Training Course Group. He attended two sessions; Practical Gilt Selection, subject day 6, Boar Care and Effective Service. subject day 4. He was a stockperson with 6 years experience and had an air of confidence which implied that he was very capable on the unit and looking forward to further promotion within the company. He did not record very high levels of improvement in skills, no increase Figure 46, and attitude, 20% increase Figure 51, sections of the training questionnaire. He scored the lowest percentage correct scores for subject day 6, Figure 48. The factual knowledge questions were a little disappointing whereas the confidence levels of self-reported knowledge were high, Figure 40 showing 30% increase in knowledge for subject day 4. The researcher was keen to assess this person with the visual-spatial ability test. The results were very disappointing with a score of less than 100 for I.Q., Figure 60. He was trainee number 5 in Table 18. He did not attempt a high percentage of set problems and scored very low on those attempted.

A short discussion with the unit manager established this person as "keen and confident but often found to be disappointing on the unit and making several mistakes. I have the impression that he does not understand fully my instructions or he is not actually listening". In 1989 when a

second set of questionnaires were mailed to the unit for this respondent to complete, the author was told that he had left the farm for other employment out of agriculture. This was a disappointment to the manager but on the evidence collected, it seemed fairly inevitable. He was interviewed by the researcher and commented that his knowledge and skills levels had increased due to a high initial level of ability in these areas for these subject days. His visual-spatial ability was low which could lead to poor performance in gilt selection and boar usage by this individual. His promotion prospects would be low along with his motivation and so he left the pig unit.

CASE TWO

The second respondent was a senior stockperson on another unit with twelve years service for the farm company who attended the 1987/88 Training Course Group programme. His coded replies to questions relating to increased knowledge, skills and attitudes showed not only small increases but also low starting points for someone of his experience. An interview, Stage V, Figure 23, with the author revealed a person who lacked confidence and yet achieved good scores in the factual knowledge sections. The results of the visual-spatial test were going to be interesting and may reveal another aspect of the story. The score achieved was very nearly the highest of all those assessed, Figure 60, a score of 136. His results are shown as Trainee number 1 in Table 18. The comment from the unit manager was:

"He is a very careful worker and always does everything that he is told to do. He enjoys going on some courses but is not ready to use his new knowledge on the unit if it may upset

anyone or the routine. He lacks a bit of confidence". Even the man's own comments centred around, "I gave myself a score of 3 although I know that my ability should be reflected in a higher score". A very different case to the previous one.

CASE THREE

The third respondent was a fairly new entrant to the industry and the pig company. He joined the pig unit eighteen months before the 1987/88 courses began and attendance gave him a good opportunity to increase his knowledge, skills and attitudes. The increases were fairly dramatic.

Table 23. Increases in Knowledge, Skills and Attitudes over the 1987/88 Training Period

	Subject Days				
	1	2	4	6	8
% increase in Knowledge	50	85	80	70	135
" " " Skills	120	100	50	90	30
" " " Attitudes	56	120	70	50	64

Figures 40, 45, 50

The increases recorded by this trainee were high and were the highest for many of the categories shown in the bar charts, Figures 41, 46 and 51.

His level of knowledge gained from the courses, as assessed by direct questions, was high. The psychometric test for visual-spatial ability gave him a middle of the scale score, Figure 60 which may indicate his future potential as a stockperson. The results for his individual answer sheet are shown as Trainee 3 in Table 18. The unit manager was very pleased with his progress and made the comments:

"He is on our trainee programme and should soon be a stockperson and senior man if we can keep him interested in pigs. His potential is high and he is a very pleasant person and we must keep him motivated". The researcher interviewed this respondent when he was given the psychometric tests. He made one or two very pertinent observations on many different areas. "I have no farming background but have always been interested in stock and the countryside. The pigs are very intelligent and I enjoy working with them. It can be very frustrating at times when your mates don't want to introduce new ideas and routines that could work. The main problem seems to be - if it costs money then we cannot do it". The final comment is a measure of the current tight margins in all sectors of the agricultural industry. Training is under pressure to show a return but it is only expressed in terms of increases in knowledge, skills and attitudes in this study.

6.5. The Trainability of Pig Unit Personnel

The visual-spatial testing has been very useful and ties up well with the evidence from other assessments on the study group. Psychological tests are not commonly used in job analysis as they are intended to test the person and not the job. However, Rae (1986) points out that the person has a strong influence on the job so in many cases, especially non-technical types of work, tests must be an instrument supporting the analysis. The tests can be used to identify the person profile to see if they fit with the job profile. If within an organisation there are people who are performing the job effectively and they are tested, then a common profile may emerge which could become a profile for the job. If an

individual differs considerably from this common profile, such a difference would suggest that it is worth investigating this individual who may have some training needs which make him/her different from the profile. The tests require caution since even reliable and validated tests may give results that are not 100% guaranteed.

The research may lead one to investigate the trainability of these personnel on a pig unit.

There are trainability tests that directly test the ability to learn by means of learning samples, e.g. training a worker may take a company six months whereas a mini course of twenty hours may do the same thing. Whether the qualities that make for fast learning in a mini course are predictable from conventional tests remains an open question, Siegel (1978). "A trainability test comprises the detailed instruction of a job applicant in a piece of work which is part of the job being applied for. The applicant then has to perform the task without any further assistance while under scrutiny from the instructor. He or she is rated according to the number and type of errors made while performing the operation", according to Kilcourse (1978).

Trainability tests have the following special features:

1. They are designed to include parts of the training which trainees find difficult, as well as elements of the job itself.
2. They involve a structured learning period.
3. They include the use of detailed error checklists written in behavioural terms, Downs (1984).

The main underlying feature of the tests is to establish, with reasonable accuracy based on objective knowledge as opposed to subjective opinion, a profile of the individual with regard to their potential for further or any training.

One can relate profiles to behaviour and performance. They can predict reactions to situations so that management can be proactive rather than purely reactive. They are also very useful in trying to pinpoint the training and learning difficulties of trainees. The DTB (Differential Test Battery) has helped to improve training methods for many courses including adult training. If there are many elements of a practical nature in the testing process then it is very difficult to validate due to staff taking tests at different centres and using different machines and testers. Tests can help in selection, appraisal, guidance, identification of training needs and as a basis for provision of wider advice and information to senior and training staff.

The training received by the participants in this study were subjected to a variety of training methods which included the formal lecture room sessions which allowed for discussion sessions as well as instruction periods. There was also training time on the pig units where certain skills were taught and practised with a fair degree of reinforcement in learning and performance. Individual people differ in behaviour as a result, in the large part, of differences in the kinds of learning experience encountered in the course of growing up. Some behavioural patterns are learned through direct experience, i.e. a person behaves in a certain manner and is rewarded or punished accordingly. People learn by observing

others' actions and by noting the consequences of those actions. However, it would be a very slow and inefficient process indeed if all of our behaviour had to be gained by direct experience. Reinforcement is not necessary for learning, although it may facilitate learning by focussing the individual's attention. It is crucial for the performance of learned behaviour. People behave in ways that are likely to produce reinforcement. A person's repertoire of learned behaviours is extensive and the particular action chosen in a specific situation depends on the expected outcome. The reinforcement that controls expression of learned behaviour may be:

1. Direct - tangible rewards, social approval/ disapproval.
2. Self-administered - self-assessment of performance with self-praise or reproach.
3. Vicarious - observing someone else receiving reward or punishment for behaviour similar to one's own.

Harrison (1988) pointed out that "performance is the outcome of a complex interaction between perceived and actual needs, results, rewards and "E" factors". Performance involves the interaction between a person's needs, their perception of the results wanted from them and the rewards being offered to them, and the amount of effort, energy and ability they have available or wish to apply to the task at hand. The four areas highlight in the definition above involve:

Needs - only those needs by which the individual is influenced at work. Minimal performance may result from tasks or jobs which only relate to those needs in a minor way.

Results - do the individuals understand what is wanted of them? Have the targets and work plans been decided jointly with their managers so that increased motivation and enhanced commitment to the job is evident?

Rewards - does the task or job offer rewards to the individuals that they value in relation to needs? Often the rewards with the greatest effect are status, praise and recognition as opposed to money?.

"E" factors - what level of effort, energy, excitement and task ability give the results required?

The relationship between the job holder and the manager is very important with regard to performance. Performance records alone will reveal nothing of that relationship, so the following summary statement is very important. "The relationship between the job-holder and their manager is a crucial influence on the job-holder's performance, and will not be revealed by performance records", Harrison (1988). The training analyst will need to know the different managers well enough to be able to assess the effects of their style, methods and general culture are having on individuals.

Therefore it is difficult to state that psychological tests and trainability tests will confirm for the company the staff who need training and those who will respond to training. The

employee's effectiveness depends on performance at work and this depends on a whole host of factors discussed earlier in this section, i.e. needs, results, rewards and "E" factors. The tests will indicate the potential of the pigpeople and their current ability. The ability of the unit managers and the company to use that potential will also depend upon motivation and the person's desire to fulfill their potential.

The data from the questionnaires prepared for both the trainees and unit managers, and the results from the psychological tests have given much support to the benefits of training to the individual and possibly the pig unit. This information will now be considered in the light of the hypothesis put forward in Chapter 2.

CHAPTER 7

CONCLUSIONS

There are many factors to be reviewed by any researcher before selecting and using any one investigational design and one data collection method as opposed to an alternative. The advantages should outweigh the disadvantages when set in the context of the project and its internal and external limitations. The investigational design and method of data collection that were chosen by the researcher have resulted in the figures and ts tables that have been analysed in Chapters 5 and 6. There are a number of conclusions which can be drawn from the analysed data associated with the development of a potentially viable system for evaluating the success of training courses for the group of trainees and for particular individuals within that group.

7.1. Selection of the Methodology.

The techniques available for research in the Social Sciences (most applicable to evaluating training) have been reviewed in Chapter 3 and Girdler (1984). The most applicable is a **pre-then-now** approach. It is a design which self-assesses the course attenders after their training and also requires them to evaluate their level before the training event. The method selected should evaluate the effectiveness or otherwise of training groups of people involved in particular enterprises. It should look at the training course and the individuals and the way in which those individuals have responded to the

course. The small number of course and group attenders may favour a case study approach but it is difficult to use the data due to the following problems:

(a) it is very dependent upon the relationship developed between the researcher and the trainees and

(b) it is time consuming for both parties.

The relationship may influence the data collected, especially if any attitudinal measurements are required (too high or too low or a central tendency bias), and interviewer bias may become an error. The time factor may also have a large bearing on the depth of the study achieved as interviews on-the-job are not always ideal on pig units and questionnaires must be completed at home in private time in many cases. The Pre-then-now design was chosen for this study as it did not succomb to the problems of the case study. The small group study, 1987/88 Training Course Group, were tested using questionnaires to establish a methodology that could be employed by succeeding group studies, i.e. the 1988/89 and 1989/90 Training Course Groups. The Pre-then-now questionnaire results for the 1987/88 Training Course Group established that a Then-now questionnaire could be used to collect the data for the succeeding 1988/89 and 1989/90 groups. The use of questionnaires and some research interviews to assess the trainees at the end of each subject day would collect data to establish criteria levels "after the course" along with an evaluation of scores "before the course". These levels of subjective criteria could be correlated to objective criteria established outside the sphere

of the training days. The selection of this method means that either the questionnaire or a set of sequenced interview questions must be developed, using pilot work, that will readily collect accurate information. The design must appeal to all personalities especially if a self-rating exercise forms the major part of the study. Once the format of the questionnaire or interview has been established it can be used for evaluating training courses in general rather than any one course in particular. The one test "after the course" should eliminate the error of maturation and familiarity with the assessment design (a typical error of Pretest and Post-test designs) and allow the respondent to give a valued judgement of their level before the course when they have a measure of what they should know. This Then-now test design may provide the evidence to validate or invalidate the inference or hypothesis that training has been the basis for improvements. Bearing in mind the researcher's knowledge of most of the designs, the Then-now technique was chosen with an equivalent control or comparative group. The Control Group is important if improvements due to the training are to be assessed. The limitations of the design chosen are discussed here along with the measures used to reduce these problems to an acceptable level, i.e. within the degrees of accuracy of the study. The problems are very real and have often invalidated much research work and so a very positive effort was made to set up a study that minimised these limitations.

7.2. The Experimental Design Limitations

A prerequisite for causal inference is that there must be no other alternative explanation which could account for a relationship between two events. The hypothesis is that training which concentrates upon one enterprise, e.g. pigs in this study, will increase the knowledge, skills and attitudes, i.e. performance of the pigpeople, which in turn will result in better herd physical performance and increased confidence for the trainee. This improvement will be tempered by the trainee's ability to be trained (trainability) and the observation that the course attender is not solely responsible for the level of particular efficiency factors within the pig unit. There are several threats to the validity and reliability of a design such that it may in fact be revealing an alternative explanation, i.e. not measuring what it was designed to measure. These limitations will be considered for the post-now design with a control group.

7.2.1. History

The design reduces the possibility of certain events intervening between the two tests in a Pretest, Post-test design. The use of an "equivalent" Control Group would reduce, if not nullify any problems with changes in climate and local conditions which may affect physical performance. Adequate data was collected for the trends in test efficiency factors to be assessed for both attenders and Control Group.

7.2.2. Maturation

An improvement in pig unit performance could be due solely to the course attenders becoming older and more experienced over the testing period. The Then-now questionnaire covered subject day topics, only, apart from the post course data collected for the 1986/87 pig enterprise course attenders one year after training. The use of a Control Group and the test design should minimise this effect.

7.2.3. Testing

The possibility of the completion of one questionnaire for one subject day affecting the results for another subject is a real one. The way that test is set, the place that is used and the emphasis upon the importance of this research work may also bias the resultant data that is collected. The testing of the Control Group should reduce this type of error by showing a similar trend. The subject day populations were never all the same people and so some of the testing problems were minimised.

7.2.4. Instrumentation

There was no significant change in instrumentation between the questionnaires used on separate subject days. The subject tutor gave out the questionnaires and they were returned by stamped-addressed envelopes. The control group data was collected by the researcher with an interview using the questionnaire as the basis for data collection. Unit staff were advised about the visit and time was allocated for completing questionnaire sections.

7.2.5. Selection

The selection of individuals to attend courses by the pig unit manager may pose problems due to the potentially biased selectivity process used by these managers. The perceived trainability of staff may result in differences being detected between types of person in experimental groups rather than to the different treatment each group has received. The attenders may suffer from the following selection points:

(a) Selection of those who attend the training course.

(b) Self-selection of those who respond to post-then questionnaires.

(c) Selection of those people who agreed to give information for the Control Group.

The experimental design is too simple for this to be a threat especially as the Control Group is affected by the same threat.

7.2.6. Control Groups

There was no problem associated with the Control Group discussing results with the study group as they lived about 50 miles apart and could not set up a rivalry to make the top score. The Control Group should be as equivalent as possible with regard to unit size and type, age range of employees, range of staff experience and similar staffing structure. If this is achieved then many of the investigational design limitations will be minimised.

7.2.7 Randomisation

The group sizes were too small to use any measure of randomisation, i.e. random selection of part of the group by the researcher.

The seven problem areas discussed have a marked effect upon internal validity. A reduction in the effect of these limitations should mean that internal validity as a problem is minimised.

The researcher has assumed that statistical conclusion and construct validity have no influence in this study. The former is no problem because simple statistical correlations are used and the latter does not apply as the researcher is trying to establish correlations rather than manipulate the correlations to prove a hypothesis. External validity stresses that the problem shown in testing and selection may isolate a certain type of person, e.g. "a constant training course attender" or "habitual questionnaire responder". The attenders for pig enterprise training were selected by their unit managers and few could be classified as "habitual questionnaire responders". The influence should be minimal along with external validity.

The researcher positively tried to reduce the effect of poor validity in the following ways:

(i) using an equivalent Control Group,

(ii) using the tutor to administer the questionnaires,

(iii) careful use of pilot work to test the whole procedure.

None of the questionnaire designs caused the attenders to refuse completion, nor did they cynically suspect the pig company of checking upon attendance and interest. Factual data and self-rating/report information was collected. This provided the objective and subjective criteria on which to test the hypothesis. The subjective measures (self-ratings) on which the hypothesis is based may correlate in some way to the objective measures, (pig unit physical performance). The factual data and the use of a psychological test also built up a picture of the type of person being sent on the courses and their range of abilities and knowledge.

7.3. Conclusions from the Data Collected

The data was collected using a design established by pilot work in the early stages of the study, 1986/87 Training Course group. The response by the groups of pigpeople who attended the courses was high. There were no problems with acceptance of the questions asked and all the questionnaires, that were returned, were complete. The information was analysed in two main areas: factual and self-report data.

7.3.1. Factual Data from the Questionnaire

There are two areas of factual data:

(a) Background data for each respondent group in the main study.

(b) Herd physical performance data.

(a) Background Data for Each Respondent

The background data was collected so that a comparison between the course attenders and the Control Group could be made to see if they were equivalent. The comparability was high and the groups came from farms with similar pig unit sizes, and types of system used. Many of the problems associated with history, maturation and selection will be solved by the close similarity of the two groups tested. The background data also built up a picture of the group of people attending the course in terms of their range of ages, experience and status. These factors may influence the trainee's response to training, questionnaire completion and ability to self-rate knowledge, performance and attitudes. It was possible to compare the groups with national and local data in the case of pig unit physical performance data.

The following facts were revealed for the main study group and the Control Group:

(i) 49% of the study population had less than five years experience with pigs (77% had less than ten years), compared with 46% for the Control Group,

(ii) 76% were aged under 25 years old (not shown as separate data in the text), and the Control Group had 79% of young people.

(iii) the status of the pigpeople in particular was such that 38% of the attenders were trainee stockpeople and 43% were stockpeople. The remainder were senior staff and supervisors.

The Control Group structure was 17% trainees and 67% stockpeople.

The overall picture of the population was that they were young, with limited training, keen to learn more about pigs and the factors affecting pig unit performance. Their current status within the staffing structure of the units tended to be at the lower levels, trainee stockperson and stockperson (81%) as one would expect. There were, however, some older, very experienced stockpeople who were attending either as a refresher or updating course.

(b) Pig Herd Physical Performance Data

There were three main efficiency factors collected from each unit so that the percentage change could be calculated and correlated with the changes in knowledge, skills and attitudes of the course attenders. Data from the study group and control and other comparative information produced the following trends over the five year period 1985-1990.

(i) Pigs Reared per sow per year. The trainee pig group achieved equivalent results to the MLC and Cambridge University costings whereas the control units were poor in two of the five years shown in Figure 32. Progress was being made on the pig units of the Training Course Groups but it was no greater than that achieved by other units. The initial level of pigs reared per sow per year was higher for the trainee group than the comparative groups and so improvements are more difficult to maintain, Table 6.

(ii) Piglet Mortality

With regard to the total piglet morality from birth to finishing, the trainee's unit performance was as variable as the comparative figures. High mortality in 1988/89 ruined what could have been substantial reductions in mortality over the five year period for the training group and the Control Group. However, progress on the national scale was also very patchy. (Control farm had large positive and equally negative swings in mortality).

Due to the fact that 2/3 of the subject days centred around reducing piglet mortality in the breeding unit, the change in mortality in this unit was singled out as a good factor to study, Figure 34.

The comparative picture, shown in Figures 33, 34 is very mixed with no obvious trends. The trainees were achieving successful reductions in mortality apart from the 1988/89 results. The control farm and MLC data once again demonstrated wide variability from year to year (-6% to +6% changes over 2 years). However, one must note from the raw data that the trainees are trying to improve upon levels of performance that are equal to the top pig producers in the recording schemes, Tables 7 and 8.

(iii) Litters per Sow per Year

Over the five year period, there was little improvement for any of the groups that were recorded, Figure 35. In some years there were large swings, both positive and negative, but the performance levels remained at the top end of the production scales, Table 9.

Overall the efficiency factors discussed there was no absolute evidence of improved physical performance over the period studied greater than the national trends that would suggest that the training of the staff was contributing to greater efficiency on the unit. However, as already noted, improving upon a high standard is difficult. Individual course attenders may be one of a team of staff responsible for the farrowing house or the finishing unit. Higher efficiency factors would require a team effort as much as an individual effort and so the work of one person is diluted by the attitudes, behaviour and labour of the team.

The starting point or base line from which improvements are expected is at the top 10% performance level for recorded and costed pig herds in the United Kingdom. Progress on further gains is therefore going to be much more difficult to achieve. The annual changes have followed the trends of the comparative groups which highlights the importance of these groups with regard to external validity - the history aspect. Despite this lack of absolute evidence, the author then reviewed the self-report data and evaluated any possible correlation between the

objective physical data and the mainly subjective data from the trainees (course attenders).

7.3.2. Self-Report Data on Knowledge, Skills and Attitude Levels

Every individual who attended a subject day training session was asked to complete a questionnaire which tested his or her knowledge, perception of their ability to perform certain skills and attitudes associated with the topic area covered on that day.

There were some objective questions that tested the areas of knowledge discussed during the sessions. There were also scales from 0 - no ability/never asked to perform this task - to 5 which implied absolute confidence to be able to perform the skill at a very high level of competence.

The areas of attitude changes were assessed on a scale of 0 to 5 where the attitude towards various management tasks and jobs needing more initiative and thought was being self-reported. There are limitations to this approach but if one is trying to establish that a training course increases knowledge, skills and attitudes then it is a valid technique to use. Everyone was told by the researcher to be as objective as possible because the results would assist in both course development and the study in progress. However an attempt to overcome the following limitations, and so reduce the errors, must be made:

(a) An unwillingness to state that one has no knowledge in a particular area.

(b) An unwillingness to assess oneself with "no skill" at a task considered to be part of one's job.

(c) A lack of ability to self-judge one's level of competence.

(d) Each person has a different set of standards on which to base their self-report measurements.

(e) A tendency to choose a middle response especially if one is not sure.

(a) The Pilot Study Data

The results of the Pilot Study were considered initially within Chapter 5. The 1986/87 Pilot Study course completed a training audit and a series of one day courses was developed. The trainees were requested to complete questionnaires, "after the course", that collected data on pig unit physical performance and self-report levels of knowledge and skills both "after the course" (Now) and an evaluation of "before the course" levels (Then). The training organiser wished to establish improvements due to the training programme but was not happy with any pretesting of knowledge and skills levels. The self-reported data showed a wide variation of scoring for knowledge of the subject areas studied and for the perceived knowledge levels of respondents attending as shown in Figures 26 and 27. The skills assessments demonstrated less dramatic changes for both subject areas and respondents, see Figures 28 and 29.

The general conclusions to be drawn from these observations centre around the trainee's perception of levels of ability in skills areas and knowledge of the subject areas discussed similar to the work recorded in Girdler (1984). A new subject

- one previously never studied in depth by the trainee - may achieve a low score at first and then a high one dependent upon the clarity and interest generated by the tutor, e.g. "benefits of induced farrowing" subject area "i" for this series of training sessions. Any skills that are considered to be always in general use by a stockperson would have high initial scores with low levels of improvement over the training period. Knowledge and the increase in knowledge would tend to be viewed as a cumulative process over time whereas the skills required to do the job would already be perceived as being part of the ability of the stockman. Apprentices may record high or steady increases in many areas whereas skilled stockpeople would admit to modest gains in knowledge and possibly small gains in skills. Bearing this in mind the author set out to consider the overview of the self-report data collected for the main study.

(b) Comparison of Pretest with Then-now Results

The results were considered under the headings of knowledge, skills and attitude changes. The first observations are directed towards the comparison of Pretest with Then-now results for the 1987/88 course. Figures 37 and 38 show that the pretest scores were higher for 60% of knowledge and 80% of skills assessments when compared with the scores given by trainees as their pre-course levels, after the training had taken place.

This observation reflects the findings of Ralph (1975) and Mezoff (1981), Figure 39. The percentage increases varied from

12 to 34% depending upon the items tested. The data from the 1987/88 Training Course Group showed differences of 3 to 18% increases for knowledge based assessments and 13 to 24% for skills categories. The areas of pretest weakness were shown to be "infertility in pigs" on the knowledge data and "aiming at maximum conception" on the skills side. The Then-now scores indicate that the knowledge and skills levels were not as high (once the total subject area had been studied) as the pre-course assessments suggested, Pretest. With the data collected following the pattern established by other researchers using a similar methodology, the results for all the groups will now be discussed.

(c) Self-Report Levels of Knowledge, Skills and Attitudes

When all the pigmen's results and ratings for different subject days were totalled, the result was a skewed distribution towards the high level of self-report, i.e. "5" on the scales given. The knowledge areas varied considerably as "Condition Scoring" and "Basic Pig Health and Disease for Beginners" gave low initial scores and considerably higher levels at the end of the subject day as shown in Figures 40 to 43. Skills levels tended to be high due to the fact that many of the trainees were experienced people, Figures 45 to 48. The attitude changes were mixed with some high levels recorded on subject days when the input was technical updating that may affect approaches to problems and complaints, Figures 49 to 53. The scale reliability was shown to be high because the item variances have been restricted and the distribution is skewed.

The coefficient was 0.74 for the main study. The total rating distribution can mask the high ratings for some individual subject areas. A comment on individual areas and individual pigmen will be pursued later. The skewed distribution was not unexpected but there were some areas of knowledge, skills and attitude, which were rated low due to little experience and so little confidence and ability.

The Then-now ratings meant that the total scores for the 1987/88 Training Course Group for knowledge, skills and attitudes increased by 49%, 44% and 35% respectively. The range of total score increases for the subject days was from 0% to 135% (all three areas together). It was very complex to assess the range of scores for individuals as not all the individuals attended every subject day, unlike the study by Girdler (1984) of shepherds and their training. The results for the 1988/89 and 1989/90 Training Course Groups showed that the knowledge, skills and attitude total scores increased by 29%, 29% (knowledge), 24%, 26% (skills) and 21%, 36% (attitude) respectively. The range for the total scores was 0% to 100% for the 1988/89 Group and 0% to 150% for the 1989/90 Group for all three areas considered.

The self-report scores for the areas assessed showed a minimum increase of 21% and a maximum of 49%. These figures do not highlight the wide range of increases as noted in the previous paragraph although they do identify a considerable positive impact of the training for all three groups of pigpeople.

(d) Statistical Analysis of Collected Data

An analysis of variance was carried out on the respondents and on the confidence data for all the subject days broken down into three areas related to herd physical performance, i.e. pigs reared per sow per year, percentage pig mortality (both total and breeding unit only) and litters per sow per year.

A reduction in the variance between respondents was recorded possibly due to the training activities, Table 12. This occurred for knowledge, skills and attitude measurements. When the same measurements were analysed against the pig unit physical performance improvements there were significant variations recorded for litters per sow per year and piglet mortality, whereas pigs reared per sow per year gave little change, Table 10. The increased variance for "after the course" self-reports, shown in Table 11, is difficult to explain other than the comment that more knowledge, skills and attitudes may mean higher scores for some people as they can more accurately assess their ability level.

An analysis of variance of the self-reported increases in knowledge, skills and attitude, Then-now, have shown that the difference between the trainees and the items assessed has been reduced as a result of the training course in many areas. The less experienced were gaining knowledge and skills to reach the level of the more experienced. The subject area variance was also interesting. Some skills are more difficult than others but by the end of the training the variation between the self-report scores was less significant. The measurable increase in

knowledge, skills and attitude led the researcher to test for a correlation between the actual data and the self-report data. The correlations were tested for self-report against the three physical data areas: pigs reared per sow per year, piglet mortality and litters per sow per year.

7.4. The Correlation between Factual and Self-Report Data

In line with the hypothesis, the factual data has been collected along with the self-report information. Each set of data has been analysed and increases in piglets reared per sow per year and litters per sow per year were recorded for the period up to end of 1988 (thereafter a sharp fall) and decreases in both total and breeding unit mortality up to the end of 1988 (thereafter an increase recorded). A larger increase in self-report assessments for the 1987/88 course than the 1988/89 and 1989/90 would seem to imply a possible correlation between the two sets of data. On this basis, the correlation coefficients were calculated to test for any possible link.

7.4.1. Rank Correlation Coefficients

Due to the experiences gained from statistical work carried out on an earlier set of data, Girdler (1984), the Spearman Rank Correlation Coefficient was used to test the correlation and not the product-moment correlation coefficient (owing to the skewed nature of the distribution of data). This coefficient does not assume linearity of the data nor does it depend upon the normal distribution of that data. The small population involved did not show a consistent level of significance for

all the unit physical efficiency factors when related to self-report levels for knowledge, skills and attitude. The five percentage significance level was recorded mainly for knowledge and skills improvements rather than attitude changes when related to unit performance, tables 13 - 15, predominantly for the 1988/89 and 1989/90 courses. The trainees were part of a team working on a large pig unit and their positive impact upon performance levels may soon be lost due to the work of another employee. The highest coefficients were scored where the physical performance data improved over a two year span along with trainee ability and confidence, Tables 13 - 15. However, there were few correlations between attitude measurements and unit physical performance. Changing attitude did not seem to correlate significantly with the unit physical results, due perphaps to the trainees inability to influence attitudes concerning established practice.

7.4.2. Control Group Correlations

The Control Group scored high levels of ability and confidence, Figures 55-57 and this was related to their achievements on the unit, i.e. physical unit performance, Tables 6 to 9. There was a poor correlation which would tend to indicate over confidence that did not reveal itself in high levels of efficiency and success.

The use of statistical analyses did not prove to be very conclusive in its ability to link self-reported levels of knowledge, skills and attitudes with factual data. A further element of this study may provide more evidence to support or

deny these findings, before judging them against four main requirements.

7.5. Psychological Tests

The researcher was involved in assessing the trainability of employees working for the study pig company and the control farm. A visual-spatial psychological test was used to try and assess the potential for improvement in knowledge and skills in particular along with attitudes. The test demonstrated that most of the staff exhibited high levels of IQ in this visual-spatial area, Figure 60.

The total scores for each participant did vary in breakdown when one considered the number of questions attempted, Table 18. The scores ranged from 16% to 86% correct answers and 6% to 36% incorrect. There were some people who did not attempt about 40% of the problems. The rotational questions scored high but there was a low ability to be able to compare one shape with another and make a judgement as to what the missing figure should be, when given several alternatives. The mental creation of a 3-D model from a two dimensional drawing also posed many problems for the trainees in a second type of test, Appendix G. Lack of time may have given rise to guesswork and unattempted questions. The tests on visual-spatial ability assess the person and the job and the two have a strong influence upon each other. They can be used to identify the person profile to see if they fit the job profile. It would seem to follow that these people have the potential to "spot an unhealthy pig" or "recognise a sow that was due to

farrow and one that was ready for service or A.I.". They were capable of a high level of "stockpersonship". Whether this is achieved in the work place is an issue that is beyond this study.

Trainability, the ability to learn, is a very complex area and is related to behaviour and performance. Further testing would have developed a profile that could have been related to reactions and situations found on the pig unit. The tests, if carried out before training takes place, would be useful in selection, appraisal, guidance, identification of training need and as a basis for provision of wider advice and information to senior and training staff. Adults were learning by experience and so the training format was very important if the learning process was to be enhanced by positive activities rather than sedentary formal teaching sessions. The psychological tests have given an indication of future trainability which may link in with increases in knowledge, skills and attitudes and eventually determine pig unit productivity.

7.6. The Requirements for Valid Correlation

The achievements of this correlation exercise must be judged against four requirements: (a) relevance, (b) reliability, (c) discrimination and (d) practicability.

7.6.1. Relevance

In the measurement of job performance, the data collected represents a theoretical construct which is hypothesised to be related to job behaviour. Do the knowledge, skills and

attitude based measurements assess this concept adequately and is the concept vital to the functioning of a skilled, experienced agriculturalist on the job? The researcher has shown that the self-reported assessments have increased over the training period but been unable to link this increase conclusively with improvements in pigs reared per sow per year, piglet mortality and litters per sow per year (three knowledge and skills related physical performance factors). Will these performance factors measure the stockperson's ability and are they useful criteria upon which to base the relevance if this person is not solely in charge of the results for the unit? The correlations were low between the subjective and objective data collected as it is difficult to apportion responsibility to one person on a unit despite the areas of control being fairly rigidly specified for the individuals, e.g. one person in farrowing house, one person in flat-decks and one person in the finishing sheds. Fairly high knowledge and skills increases were true for the first group in the main study but to a lesser extent for the other groups. Hence the identification of perceived improvements of trainees demonstrates that the training is seen as relevant. The problem is the exact performance factors with which to relate this improvement and show a significant correlation.

7.6.2. Reliability

This refers to the accuracy and consistency or reproducibility of measurements. Attitude measurement is and will always be complex but remains a viable and vital method of evaluating a

field experiment. The Cronbach Alpha Coefficient has shown that the reliability for the tasks is high. The herd physical data has come from farm records and so the reliability is again very high. The main area of concern is that the reliability coefficient should express the extent to which the scale measures accurately what it has been designed to measure. The high rank correlation would support the premise that the researcher has measured the correct factor.

7.6.3. Discrimination

The scale should distinguish between the confident, competent stockperson and his/her less experienced, less confident counterpart. This is a validity characteristic. The validity measure indicates the extent to which a scale measures accurately what it purports to measure. The knowledge, skills and attitude measures gave low correlations (small improvements) for experienced pigpeople and high correlations (large improvements) for inexperienced staff. A balance of the two extremes in the group to be trained would show a poor overall correlation. The discrimination is limited by the balance of the total population of trainees.

7.6.4. Practicability

The courses are traditionally taken in the winter period and the training should be a factor in reducing mortality and improving pigs reared and litters produced per sow per year There may be the implication of a relationship between the performance and the propensity to become involved in training. Some people who need the training do not always recognise this

need and are not put forward by unit managers for courses. These staff are confident in their own ability with regard to skills levels and knowledge. They will only go on courses if they are part of a training scheme that specifies a routine schedule of updating and initial training. The unit managers on the studied pig units do not have an objective system of staff appraisal which is translated into a regular, easily monitored staff development programme. Some of the trainees may not be very "trainable" due to poor abilities in verbal, non-verbal and in particular visual-spatial abilities, yet they may be very keen to attend. These problems will be true for any course population if the whole system is not carefully and objectively evaluated. The Control Group Stockpeople tended to assess themselves as "very confident" in the skills and attitude measurements and did not need any training. This was rarely reflected in their unit physical data. On balance most of the course attenders were keen to learn and update knowledge and skills, even the most experienced, and they achieved some success over the duration of the training.

Individuals within the population achieved high levels of self-reported knowledge and skills. As individuals within a population they are important and their responses to a subject day will vary considerably as shown by the range of percentage increases reported in Chapter 5. The visual spatial ability testing established that 53% of the 1987/88 Training Course Group attenders achieved high scores, Figure 60. The three individual case studies reported in Chapter 6 demonstrate some

links between visual spatial ability and performance of individuals on the pig unit. The full SPSS computer program would have looked at the contribution of individuals to the whole, but with a small population, 20-30 people per Training Course Group maximum, it was expensive in staff and computer time to use it. If an evaluation technique for testing the effectiveness of training courses for experienced agriculturalists is to be found then one must accept that individuals within a group will vary and their responses may not be reflected in the overall group results, Girdler (1984).

7.7. A Comparison of the Analysis with the Hypothesis

All the analyses and the correlations must be compared with the hypothesis outlined in Chapter 2. The increases in knowledge, skills and attitude should be translated on the pig unit into improvements in herd physical performance. The trainability of the staff should match with the course content and style of delivery bearing in mind that they are adult learners. The course evaluation should measure the changes relevant to the training of experienced agriculturalists.

An evaluation of the training courses has shown the following improvements and correlations as a direct result of attending the courses:

(a) For the course attenders the pigs reared per sow per year increased from 1986 to 1988 but fell away after that period similar in pattern but greater than local data.

(b) The percentage mortality in the breeding unit improved at a greater rate than the control and MLC groups. However, the

total mortality was poorer than these comparative units. Any decreases in mortality up to 1988 were negated by poor results in 1989 and 1990.

(c) The litters per sow per year improved until 1989 and then fell back to the pre-training level. The level of efficiency factor, however, was higher at all times than all of the comparative data.

(d) Individual stockpeople achieved remarkable improvements in self-reports for knowledge, skills and attitudes but it was more difficult to state that improved physical unit performance was due directly to any one individual.

(e) Every course attender recorded some level of improved self-ratings in the areas assessed.

(f) Significant differences between the pigpeople and the features assessed (as shown by self-ratings) were reduced as the courses were completed (as shown by the reduced variances). The less experienced stockpeople increased knowledge, skills and attitude levels to a much greater degree than the experienced stockpeople.

(g) High visual-spatial ability measures were achieved by many of the pigpeople. This indicated a high level of inherent ability in this area which is so important to effective "stockpersonship".

(h) Some high correlations were shown between subjective self-ratings and objective unit physical efficiency data. However, many of the tested correlations were not significant.

(i) The factual data and self-report data improved in line with the comparative groups and over the course duration, respectively and some significance has been reported.

The training has been effective in improving the unit physical performance and increasing the knowledge, skills and attitudes of the pig stockpeople. Some significant correlations between the two areas demonstrate the success of these adult craft courses, especially for knowledge and skills related topics.

7.8. The Validity of the Hypothesis

The hypothesis put forward in this project suggests that a correlation should exist between the improvements in herd physical performance and the training received on the course. The problem is the way in which one is able to quantify the improvements in the experienced, adult trainees due to the course of instruction. A self-report assessment of knowledge, skills and attitudes, subjective criteria, was undertaken for this study and this was correlated with the physical unit data, objective criteria. The three areas of physical data chosen were pigs reared per sow per year, percentage piglet mortality and litters per sow per year. The eight subject days were designed to cover the needs of the units and were related to these factors.

7.8.1. Objective Criteria related to the Hypothesis

The physical unit data showed that the Training Group Course attenders achieved the following level of performance over the period 1986-1990:

(a) pigs reared per sow per year increased by 0.5%

(b) percentage total piglet mortality increased by 6.7%

whereas breeding unit mortality decreased by 7.9%

(c) litters per sow per year decreased by 2.5%

The low level of improvement reflects the poor years of 1989 and 1990, which followed the national trend, along with an initial high standard of performance.

7.8.2. Subjective Criteria related to the Hypothesis

The study has established that measurable increases in knowledge, skills and attitude levels have occurred for all attenders, with wide variation occurring between individuals. However, the analysis of variance demonstrated that the variability in response to self-reports (Then-now) was considerably reduced by the training programme. The range of percentage increases has been graphically presented in this study, Chapter 5. It demonstrates the improvements that should be levelling out any knowledge, skills and attitude level anomalies within the pig unit staff, i.e. the inexperienced are trained to a high level of competence and ability comparable with their experienced colleagues. These measurable increases, that were perceived to have occurred due to the training experience, should now be used to improve the pig unit physical performance.

7.8.3. Correlation between the Selected Criteria

The Spearman rank correlation coefficient was used and revealed limited significance in the correlations between objective and

subjective data. However, the significant correlations that were found related mainly to knowledge and skills assessments. The Control Group scored high self-reports with little apparent inclination towards outside training. The correlation with unit performance was shown to be limited.

7.8.4. Visual-Spatial Ability

The whole population for the 1987/88 Training Group Course and the Control Group were requested to participate in a visual-spatial test to measure the level of intelligence in this area. The general levels were high when compared to the standards set in the text for the tests. This would indicate a potentially high response level by the trainees to the type of training that used any visual-spatial techniques. This could be exploited by using the work place as the class room for the subject day sessions. This was the concept for the 1989/90 Training Group Course sessions. The improvements were good when compared with the other years but they were not statistically significant due mainly to a sharp deterioration in physical unit performance on the Training Course Group pig units. The poor performance was found to be a National trend.

7.8.5. Re-assessment of Levels of Competence

The first course (1987/88) of the main study was re-assessed one year later for certain of the knowledge, skills and attitudes areas. Most of the new scores collected were the same as those noted down by the trainees at the end of the subject days one year earlier. This would seem to infer that the self-reported knowledge levels and skills abilities were

retained in the long term memory along with any possible attitude changes. Some of the individuals assessed themselves slightly lower than originally but few, if any, re-assessed at a higher level.

7.8.6. A Structured System for Staff Development

The research indicates the value of small scale surveys in validation and evaluation work. It also indicates the importance of training and concentrating effort into one farm enterprise rather than general livestock training. Further effort and research needs to be carried out to establish the use of knowledge, skills and attitude audits by employers so that training can be targeted to complement the training needs identified very closely and clearly by the audit. This would be better than the "gut feeling" and "it was about time he had some staff development", approach by many of the unit managers. A reliable, valid, practical and relevant criterion based test is needed to assess "stockpersonship" proficiency but this is not easy to find due to the many variables existing in any one pig unit-trainee-trainer situation. Training courses are very important and a vital part of keeping the experienced person fully equipped at all times to practise their skills today and in the future. Most individuals who are motivated to attend these adult craft, skills courses will learn something from the training and gain confidence in certain areas which should be converted into improved physical and possibly financial performance for the enterprise concerned.

7.8.7. The Effectiveness of the Chosen Methodology

The study used the Then-now methodology to assess the perceived increases in knowledge, skills and attitudes. The results matched closely the research work carried out by Ralph (1975) and Howard et al (1979-1985). The questionnaires were used successfully to collect the data and the balance of closed and scaling questions gave quantitative and qualitative information for analysis. The next stage would be to follow the individual's progress back to the pig unit and monitor their impact upon the physical performance of the pigs. This impact assessment was not pursued by the researcher due to the time involved and the high level of intrusion on the unit. The unit managers agreed to check on their newly trained staff but the comments and data collected were insufficient for useful discussion.

7.8.8. Trainee Profile Analysis

Discussions were held between the researcher and the senior management of the pig company concerning the introduction of personnel profile analysis (Davies 1989) to detect changes in knowledge, skills and attitude. However, this system has not as yet been introduced, even though it was agreed to be a useful tool in evaluating the effectiveness of training and even assisting in recruitment and promotion of staff within the company. The psychological testing proved to be a useful tool in highlighting certain staff with poor visual-spatial ability (two staff were shown to have low levels and left the company after the managers were disappointed with their progress). Further tests need to be carried out so a general ability test

battery may be administered to the course attenders and some non-attenders. These tests would take up a considerable amount of time for both the researcher and the stockperson but may lead towards a profile of the abilities required to be a successful pigperson. This could then be employed as the specification for comparison with the profiles of the staff who are due to attend some training sessions. The tests should determine the general areas requiring the training and also the "trainability" of course attenders (the areas of lack of ability at present and potential future improvements in certain abilities will be identified).

This small scale survey has identified that training improves the perceived levels of ability but the link with improved unit performance is tenuous. The sudden deterioration in physical performance of the pigs on the Training Course Group units and in the nationally recorded units meant that an inconclusive correlation was achieved. This would seem to indicate that improved staff abilities may have contributed to poorer pig performance and highlights the following factor. The main problem centres around the trained individual being part of a team. Other members of the team may not be trained or motivated to improve their performance on the unit and also that of the pigs. The resultant unit performance levels may not be representative of the trained staff or the whole staff. They may be indicative of the motivation and behaviour of the staff rather than all the previous and present training.

7.9. Further Research Activity

Further effort and research is needed to establish the reliable, valid, practical and relevant criteria of stockpersonship proficiency that will lead more quickly to the evaluation of the effectiveness of training courses for experienced agriculturalists. A closer investigation of the individual stockperson should provide specific and general ability profiles of these individuals. This research would identify the "trainability" of the livestock unit staff and hence ensure that the training is effective and continues to be a very important and vital part of keeping the experienced person fully equipped at all times to practise their skills and use their knowledge today and in the future. Most individuals who are motivated to attend these adult craft skills courses will learn something from the training and gain confidence in certain areas which may be converted into improved physical performance for the livestock unit. This study used a methodology which resulted in conclusions that may be difficult to extrapolate to all training courses. A lot more work needs to be carried out on training versus no training with regard to job effectiveness and success. This should support the review results from recent studies in this area. A wider, larger sampling technique should be used to allow for inferences to be made in the area of training effectiveness.

The main problem to be investigated centres around the effectiveness of training. A wider study using courses from many Training Course Groups for differing enterprises needs to be commissioned. The Then-now technique would be employed as

it is more practical for trainees to obtain results "after" a course rather than "before and after" even if it is built into the training programme. The physical results from the enterprises in which the trainees are involoved will be collected. A questionnaire will be prepared for the supervisor of each trainee and assessments of knowledge, skills and attitude levels will be made "before" the course and "after" the course. These levels will be compared to the trainee profile, Davies (1989), and monitored regularly to demonstrate progress. Knowledge assessments can be arranged through the employers/supervisors and skills tests can be administered by an A.T.B. instructor. These achievement tests provide a standard for judging the predictive ability of aptitude tests. The difficulty may be separating the influence of this individual upon a group activity on the farm or unit. Progress may be made on this front by using a full General Ability Test Battery to create a psychological profile for individuals employed within different enterprises. The profile would be compared to standard profiles for individuals in similar manual vocations. Weak points in the trainee's ability can be recognised so that either suitable training can be agreed and implemented or new job descriptions created within the organisation.

The managers would then be in a position to select staff for training on the basis of the information from the psychological profiles and the achievement tests that clarify the level of skills and knowledge. The progress and development of staff

can be compared using the self-report assessments and the supervisor reports that will monitor the staff profiles in respect of knowledge, skills and attitudes.

The future research would include a large scale questionnaire survey, using the Then-now methodology, to collect the data. There would be the collection of both objective and subjective data. The enterprise physical performance of the unit, where the trainee works, would be recorded along with self-reported assessments of increases in knowledge, skills and attitudes due to the training. A full psychological study of a sample of the population of trainees would be carried out by either using a random or quota sampling technique. A Control or Comparative Group who do not use any training would be difficult but not impossible to find. The results should provide a basis for establishing the trainability of mature, experienced agriculturalists.

The results recorded by the author indicate that training may lead to improved levels of knowledge, skills and attitudes and it may be the latter that will increase livestock unit performance.

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APPENDICES

A - A.T.B. - "Unlock your Unit Performance

B - 1986/87 course "then-post" and follow up 18 months later

C - Unit Managers Questionnaire

D - Unit Physical Performance Data

E - Subject Day Questionnaire for 1987/88

F - Subject Day Questionnaire for 1988/89 and 1989/90

G - Visual Spatial Test

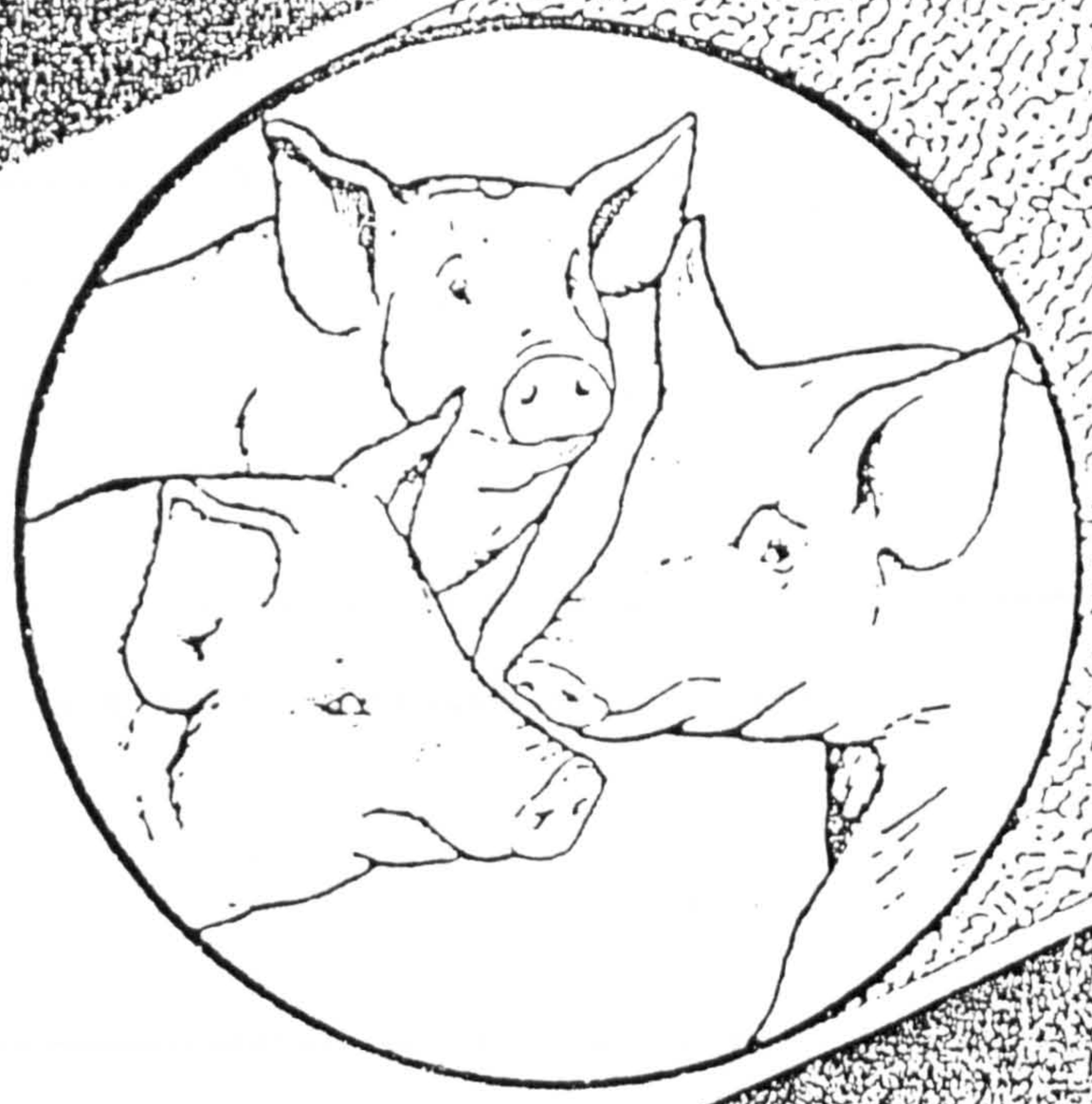
H - 1 year/2 year follow-up Questionnaire

I - Control Farmer's Comments on Training

APPENDIX A

C O N F I D E N T I A L

Unlock Your Unit Performance



With

PIG PRODUCTION Enterprise Training

MVH 1986

ASSESSING THE BUSINESS

FOR YOUR BUSINESS WHAT ARE THE MAIN:

STRENGTHS - (which can be built on)

Number of pigs per sow per year
Feed consersion and feed cost per kg live weight gain

WEAKNESSES - (that can be minimised)

Piglet Mortality

CHANGES -

Insulating pig buildings

OPPORTUNITIES - (that can be built on/grasped)

Pig disease in the herd

THREATS - (which will have to be combated or avoided)

NOW - WHAT TRAINING COULD HELP YOU
- build on strengthsX
- minimise weaknesses
- build on opportunities X
- avoid threats
- prepare for changes

Text cut off in original

REVIEW ENTERPRISE TARGETS

r performance assessment should include a review of the results or targets .u are aiming for. To help you do this, write down your present performance .nd the standard you would like to reach over the next two or three years.

	MLC AVERAGE	MLC TOP THIRD	YOUR CURRENT PERFORMANCE	DESIRED PERFORMANCE
Sow replacements	39.0	40.6	39.5	4.00
Successful services	86.3	90.5	87.3	90.5
Litters per sow per year	2.23	2.38	2.23	2.50
Pigs reared per sow per year	21.2	23.7	22:1	25.00
Quantity of sow feed per sow per year	1.202	1.195	1.101	1.000
Average litter size (born alive)	10.66	11.10	10.61	11.50
Average pigs born dead per litter	0.82	0.87	1.3	0.50
Average litter size (alive and dead)	11.48	11.97	11.73	12.00
Piglet mortality	11.2	10.1	14.00	8.00
Quantity of feed per pig reared(kg)	62	55	53	50
Average weight of pigs weaned (kg)	7.2	7.1	7.5	8.0
Average weight at entry	6.3	5.6	7.5	8.0
Average weight on leaving	39.2	39.7	32.	40.
Average weight gain	32.9	34.1	18.	35.
Feed fed per pig per day (kg)	0.94	0.93	0.81	0170
Feed conversion ratio	2.18	1.96	2.01	1.50
Feed cost/kg liveweight gain	36.62	31.74	37.81	28.00

NB These figures are based on results for Breeding Herds weaning at 26 to 32 days and on Rearing Herds average weight at entry .4 - 10 kg - both compound fed.

Thanks to MLC for the use of these figures.

KEY JOB AND DECISION AREA					
Service of Sows	xxx	x	xxx	xxx	xx
Litter for year,per sow	xxx	xx	xx	x	xxx
Pigs reared per litter	xxx	xx	xxx	xx	xxx
Food conversion of the fat pig	xxx	xxx	x	x	xx

ASSESSING INDIVIDUALS

MANAGEMENT ASSESSMENT	FARMER	WIFE	SON	UNIT MANAGER	Company Sec
How well does he/she ...? NAME				B.H.	
ACTIVITIES AGE (Years in Job)				27	
1 Understand/interpret annual accounts				X	X
2 Produce annual budgets					X
3 Produce cash flows					X
4 Minimise tax liability					X
5 Plan capital investment charges					X
6 Complete cash analysis and VAT					X
7 Plan efficient work methods and organise tasks				X	
8 Use own time effectively				X	X
9 Lead staff				X	X
10 Motivate staff				X	X
11 Show people how (teach/coach)				X	
12 Communicate with staff/boss/ colleagues				X	X
13 Delegate work to staff				X	X
14 Recruit and select staff				X	X
15 Conduct staff appraisal				X	X
16 Plan staff training and development				X	X
17 Lead or contribute at meetings				X	X
18 Make decisions and solve problems				X	X
19 Negotiate (with buyers and suppliers)				X	
20 Select market trends				X	
21 Forecast market trends				X	
22 Stay within employment law					X
23 Stay within safety law				X	X
24 Handle paperwork efficiently				X	X
25 Keep stock/crop records				X	X

N O W - SELECT PRIORITIES - Tear off this sheet and decide on 5-10 training priorities for this year. By looking of the "assessment" boxes you have filled in and asking yourself which of these needs is essential to achieving the targets on page 3.

TRAINING PLAN FOR .....

Fill this in now | Discuss with your organiser

WHO Name	WHAT	WHY What do you hope will be the results of training	WHEN Time of year	HOW Discuss with your CTO, how to meet the need

APPENDIX B

PIG COURSE QUESTIONNAIRE

Thank you for agreeing to complete this short questionnaire.

1. Would you please complete the following table of data from your pig unit recording scheme.

Breeding Unit	Past 6 months *	Present 6 months
Litters/sow/year	*	
Pigs born alive/litter	*	
Pigs weaned /litter	*	
Pigs reared/sow/year	*	
Quantity sow feed/sow/yr	*	
Feeding Unit	*	
Quantity feed/pig reared	*	
Average weight gain	*	
Feed conversion ratio	*	
Feed cost/kg livewt. gain	*	

2. You have now attended a series of short day courses and I would appreciate your estimation of any increases in knowledge that you can say are due directly to the lecturers/Vets talks. *Please mark with a cross on the line the number which best describes your level of knowledge on the subject areas below (before and after) eg.* 0——×——5

		No Knowledge yet *	Complete Knowledge *
a) Preparation of the sow before service	(before)	0	5
	(after)		
b) Managing services	(before)	0	5
	(after)		
c) Recognition of disease symptoms	(before)	0	5
	(after)		
d) Prevention of diseases	(before)	0	5
	(after)		
e) Hygiene required at farrowing	(before)	0	5
	(after)		
f) Preparation of the sow before farrowing	(before)	0	5
	(after)		
g) Managing farrowing	(before)	0	5
	(after)		
h) Causes and prevention of MMA	(before)	0	5
	(after)		
i) Benefits of Induced farrowings	(before)	0	5
	(after)		
j) Causes of piglet mortality	(before)	0	5
	(after)		

k)Different ways to foster and wean (before) 0———————————5
(after) ———————————

l)Avoid piglet crushing (before) 0———————————5
(after) ———————————

m)Care of the sow & weaner (before) 0———————————5
(after) ———————————

n)Recognise signs of oestrus (before) 0———————————5
(after) ———————————

o)Feeding for max. conception (before) 0———————————5
(after) ———————————

p)Are there any other specific areas where increases in knowledge were experienced ? Yes/No
If the answer is "Yes" then please state the areas or subjects or facts that you think have increased your knowledge and could be used at work (please assess the level of increase as a number in brackets, on a scale from 1-5, after the area or subject or fact has been stated).

---

3. As an adult, experienced, agricultural employee, you will have varying levels of confidence in the topic areas discussed on the subject days. *I would appreciate an estimation of your level of confidence in the following topic areas and request that you put a cross on the line/scale provided. One line will show your confidence level (before) the course and the second line underneath will indicate your present estimated confidence level.*

No confidence not done the job yet — Very confident

a)Preparation of the sow before service (before) 0———————————5
(after) ———————————

b)Managing services (before) 0———————————5
(after) ———————————

c)Recognition of disease symptoms (before) 0———————————5
(after) ———————————

d)Prevention of diseases (before) 0———————————5
(after) ———————————

e)Hygiene required at farrowing (before) 0———————————5
(after) ———————————

f)Preparation of the sow before farrowing (before) 0———————————5
(after) ———————————

g)Management of a farrowing (before) 0——————————5
(after) ——————————

h)Causes and prevention of MMA (before) 0——————————5
(after) ——————————

i)Benefits of Induced (before) 0——————————5
(after) ——————————

j)Causes of piglet mortality (before) 0——————————5
(after) ——————————

k)Different ways to foster and wean (before) 0——————————5
(after) ——————————

l)Avoid piglet crushing (before) 0——————————5
(after) ——————————

m)Care of the sow & weaner (before) 0——————————5
(after) ——————————

n)Recognise signs of oestrus (before) 0——————————5
(after) ——————————

o)Feeding for max. conception (before) 0——————————5
(after) ——————————

p)Are there any other specific areas where increases in confidence were experienced? Yes/No

If the answer is "Yes" then please state the areas or subjects or facts that you think have increased your confidence and could be used at work (please assess the level of increase as a number in brackets, on a scale from 1-5, after the area or subject or fact has been stated).

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. The results will be a useful guide to future course designs and requirements.

Derek J. Giesler.

THE UNIVERSITY OF NOTTINGHAM

Telephone: KEGWORTH (STD 05 097) 2386

Head of Department:
Professor J. D. IVINS, M.Sc. Ph.D., F.R.Ag.S.

DEPARTMENT OF
AGRICULTURE AND HORTICULTURE
SCHOOL OF AGRICULTURE
SUTTON BONINGTON
LOUGHBOROUGH
LE12 5RD

Dear Mr.

In my discussion with the group, at one of the sessions of your pig training course run by Trevor Simpson in Winter 1987 , I requested your help in trying to evaluate the usefulness of the series of lectures and practicals. I mentioned that a short questionnaire was being prepared for you to complete at the end of the training period. Thank you for your reply.

It is now 18 months after the sessions and I am trying to assess how much you have remembered and how much it has boosted your confidence.

If you agree to assist me in this study, then the information collected will be kept in strictest confidence and only used in an anonymous form within a thesis in the library at Nottingham University. The same questionnaire will be used with other pig courses run in the region and all the data will be summarised to support the idea that training for adult, experienced, agricultural employees is both cost-effective and valuable to those individuals.

If you can spare a few moments to complete the questionnaire and return it to me in the prepaid envelope, I would be very grateful.

Yours sincerely,

(Derek Girdler)

PIG COURSE QUESTIONNAIRE

Thank you for agreeing to complete this short questionnaire.

1. Would you please complete the following table of data from your pig unit recording scheme.

Breeding Unit	Current 12 months *	Current 6 months
Litters/sow/year	*	
Pigs born alive/litter	*	
Pigs weaned /litter	*	
Pigs reared/sow/year	*	
Quantity sow feed/sow/yr	*	
Feeding Unit	*	
Quantity feed/pig reared	*	
Average weight gain	*	
Feed conversion ratio	*	
Feed cost/kg livewt. gain	*	

2. You attended some of the short day courses in 1987 Winter, arranged by Trevor Simpson and I would appreciate your estimation of any increases in knowledge that you have retained and used over the last 18 months that was due directly to the lecturers/Vets talks. *Please mark with a cross on the line the number which best describes your current level of knowledge on the subject areas below* - EVEN IF YOU DID NOT ATTEND.

		No Knowledge yet *	Complete Knowledge *
a)Preparation of the sow before service	(after)	0	5
b)Managing services	(after)	0	5
c)Recognising diseases	(after)	0	5
d)Prevention of diseases	(after)	0	5
e)Hygiene needed at farrowing	(after)	0	5
f)Preparation of the sow before farrowing	(after)	0	5
g)Managing farrowing	(after)	0	5
h)Causes and preventing MMA	(after)	0	5
i)Benefits of Induced farrowings	(after)	0	5
j)Preventing starvation	(after)	0	5
k)Causes of piglet mortality	(after)	0	5
l)Different ways to foster and wean	(after)	0	5

m)Avoid piglet crushing (after) 0----------5

n)Care of the sow & weaner (after) 0----------5

o)Recognise signs of oestrus (after) 0----------5

p)Feeding for max. conception (after) 0----------5

3. As an adult, experienced, agricultural employee, you had varying levels of confidence in the topic areas discussed on the subject days. *I would appreciate an estimation of your level of confidence in the topic areas used above and request that you CIRCLE the number on the scale provided to show your current estimation of your confidence.*

		No confidence not done the job yet					Very confident
		*					*
a)Preparation of the sow before service	(after)	0	1	2	3	4	5
b)Managing services	(after)	0	1	2	3	4	5
c)Recognising diseases	(after)	0	1	2	3	4	5
d)Prevention of diseases	(after)	0	1	2	3	4	5
e)Hygiene required at farrowing	(after)	0	1	2	3	4	5
f)Preparation of the sow before farrowing	(after)	0	1	2	3	4	5
g)Management of a farrowing	(after)	0	1	2	3	4	5
h)Causes and preventing MMA	(after)	0	1	2	3	4	5
i)Benefits of Induced farrowings	(after)	0	1	2	3	4	5
j)Causes of piglet mortality	(after)	0	1	2	3	4	5
k)Preventing starvation	(after)	0	1	2	3	4	5
l)Different ways to foster and wean	(after)	0	1	2	3	4	5
m)Avoid piglet crushing	(after)	0	1	2	3	4	5
n)Care of the sow & weaner	(after)	0	1	2	3	4	5
o)Recognise signs of oestrus	(after)	0	1	2	3	4	5
p)Feeding for max. conception	(after)	0	1	2	3	4	5

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. The results will be a useful guide to future course designs and requirements.

APPENDIX C

UNIT MANAGER QUESTIONNAIRE

The questions asked at the interview are listed below:

1. How many people do you have on your unit?
2. What is the unit organisational structure?
3. How often do you have meetings with your staff?
4. How often do you discuss the performance and finances of your unit with the staff?
5. What do you feel about the training that is being offered to your staff at the moment?
6. How would you improve it?
7. Do you have a formal report-back session for each member of staff attending training courses?
8. How do you assess who needs training and in what?
9. Do you feel that a questionnaire should be completed after each subject day session to assess the effectiveness of that training?
10. Do you have a positive attitude towards training or do you feel that you could teach them everything they need to know on their own units?

APPENDIX D

FORM V2

TECHNICAL PERFORMANCE 19 86

FARM	PRODUCTIVITY									FEED CONSUMPTION				
	LIVE BIRTHS /LITTER	% MORTALITY					REARED LITTER	LITTERS SOW	REARED* SOW YEAR	KG/FINISHED PIG			F.C.R.* LIVE	F.C.R DEAD
		FARROWING	FLAT DECKS	REARING	FATTENING	TOTAL				SOW	CREEP	FATTENING		
METHWOLD														
LAST YEAR	9.71	11.00	1.30	0.50	1.40	14.20	8.30	2.40	19.90	60.00	3.20	201	2.67	3.67
JAN MAR	9.88	10.92	1.35	0.51	1.52	14.35	8.47	2.35	19.90	58.88	4.22	201	2.83	3.82
APR JUN	9.89	9.25	1.28	0.56	1.50	12.59	8.65	2.39	20.67	53.58	4.08	193	2.70	3.65
JUL SEP	9.88	10.22	1.09	0.65	1.61	13.57	8.54	2.42	20.67	54.39	4.03	194	2.72	3.68
OCT DEC	10.10	11.07	1.11	0.58	1.67	14.43	8.65	2.70	23.32	54.19	2.73	198	2.75	3.72
YEAR	9.94	10.37	1.21	0.58	1.59	13.74	8.58	2.47	21.14	54.76	3.76	197	2.75	3.72
MUNDFORD														
LAST YEAR	10.47	10.00	0.80	0.80	0.90	12.50	8.20	2.29	21.10	63.50	8.20	191	2.81	3.79
JAN MAR	10.55	15.30	2.09	0.84	1.14	19.37	8.54	2.38	20.31	58.97	5.34	185	2.69	3.64
APR JUN	10.55	9.87	1.87	0.50	1.19	13.43	9.14	2.42	22.12	60.92	8.07	194	2.82	3.81
JUL SEP	10.44	10.30	1.40	0.85	1.28	13.81	8.97	2.31	20.68	56.76	5.32	194	2.78	3.75
OCT DEC	10.67	9.43	1.68	0.46	1.08	12.65	9.32	2.51	23.38	56.83	5.44	180	2.62	3.54
YEAR	10.55	11.25	1.76	0.66	1.17	14.84	8.99	2.41	21.62	58.37	5.54	188	2.73	3.69
BRADENHAM														
LAST YEAR	10.05	9.30	1.60	0.90	1.50	13.30	8.70	2.38	20.50	57.50	3.70	201	2.82	3.82
JAN MAR	10.14	8.40	2.94	1.09	1.36	13.79	8.75	2.36	20.65	53.62	3.42	202	2.80	3.78
APR JUN	10.13	10.23	1.35	0.87	1.43	13.98	8.72	2.29	19.97	51.01	2.61	201	2.75	3.72
JUL SEP	9.96	7.29	1.84	1.09	1.93	12.15	8.76	2.47	21.64	49.64	4.22	198	2.72	3.68
OCT DEC	9.92	7.52	1.37	0.58	1.18	10.65	8.86	2.45	21.75	49.76	5.60	206	2.82	3.81
YEAR	10.04	8.36	1.88	0.93	1.48	12.64	8.77	2.39	21.00	51.01	3.96	202	2.77	3.75
WHITEGATE														
LAST YEAR	10.27	10.30	1.80	0.90	1.00	14.00	8.80	2.38	20.90	52.90	7.70	192	2.72	3.68
JAN MAR	10.37	9.57	1.68	0.95	1.64	13.82	8.93	2.41	21.52	51.02	6.12	191	2.69	3.63
APR JUN	10.33	8.08	1.76	1.15	1.45	12.44	9.04	2.43	21.97	54.40	5.13	188	2.67	3.61
JUL SEP	10.36	8.09	1.77	0.78	2.15	12.79	9.03	2.49	22.48	55.26	5.13	187	2.67	3.61
OCT DEC	10.44	7.30	2.69	1.14	2.51	13.64	9.02	2.36	21.28	53.46	6.06	202	2.83	3.82
YEAR	10.38	8.26	1.97	1.01	1.94	13.17	9.01	2.42	21.81	53.54	5.61	192	2.72	3.67
SPEY														
LAST YEAR	9.96	7.60	0.90	1.10	1.00	10.60	8.90	2.35	20.90	62.30	5.00	184	2.71	3.67
JAN MAR	10.22	10.14	0.73	1.08	1.11	13.06	8.88	2.49	22.11	48.14	3.87	193	2.65	3.58
APR JUN	10.06	8.72	0.84	1.42	1.23	12.21	8.83	2.42	21.37	51.94	3.72	184	2.58	3.49
JUL SEP	10.20	9.19	0.60	0.96	1.02	11.77	9.00	2.38	21.42	54.31	3.75	185	2.62	3.54
OCT DEC	10.10	7.88	0.70	1.18	0.82	10.58	9.03	2.42	21.88	55.94	3.81	174	2.52	3.41
YEAR	10.15	8.98	0.72	1.16	1.05	11.91	8.94	2.43	21.70	52.58	3.79	184	2.59	3.51
ALL FARMS														
LAST YEAR	9.98	10.10	1.30	0.80	1.20	13.40	8.60	2.38	20.50	59.40	4.60	195	2.80	3.79
JAN MAR	10.15	10.62	1.62	0.85	1.39	14.48	8.68	2.39	20.75	53.70	4.40	196	2.75	3.71
APR JUN	10.11	9.21	1.34	0.90	1.38	12.83	8.81	2.39	21.06	53.64	3.97	192	2.69	3.64
JUL SEP	10.09	9.15	1.26	0.84	1.58	12.83	8.80	2.42	21.30	53.91	4.31	192	2.70	3.65
OCT DEC	10.18	8.98	1.36	0.78	1.45	12.57	8.90	2.50	22.27	53.95	4.32	193	2.71	3.66
YEAR	10.13	9.49	1.40	0.84	1.45	13.18	8.80	2.43	21.35	53.80	4.25	193	2.71	3.67

* Based on ACTUAL Herd Size @ Standard Pig - 68·5kgs dead @ 74% killing out - 92·5kgs (204lbs) live

FORM V2

AMENDED

TECHNICAL PERFORMANCE 19 87

FARM	PRODUCTIVITY									FEED CONSUMPTION				
	LIVE BIRTHS /LITTER	% MORTALITY					REARED LITTER	LITTERS SOW	REARED* SOW YEAR	KG/FINISHED PIG			F.C.R.@	F.C.R
		FARROWING	FLAT DECKS	REARING	FATTENING	TOTAL				SOW	CREEP	FATTENING	LIVE	DEAD
METHWOLD/FELTWELL LAST YEAR	9.94	10.37	1.21	0.58	1.59	13.74	8.58	2.47	21.14	54.76	3.76	197	2.75	3.72
JAN MAR	10.21	11.35	1.40	0.40	1.59	14.74	8.71	2.30	20.03	58.49	4.28	191	2.75	3.72
APR JUN	10.25	9.76	1.14	0.38	1.50	12.76	8.84	2.41	21.51	58.31	4.30	178	2.61	3.52
JUL SEP	10.08	9.15	1.41	0.45	1.38	12.39	8.81	2.40	21.12	57.57	4.45	192	2.77	3.74
OCT DEC	10.28	8.77	1.34	0.51	1.02	11.67	9.08	2.30	20.92	61.81	4.56	188	2.75	3.72
YEAR	10.20	9.73	1.32	0.41	1.36	12.85	8.89	2.35	20.92	60.10	4.42	187	2.72	3.68
MUNDFORD LAST YEAR	10.55	11.25	1.76	0.66	1.17	14.84	8.99	2.41	21.62	58.37	5.54	188	2.73	3.69
JAN MAR	10.92	14.52	2.14	1.83	1.07	19.57	8.82	2.40	21.17	57.61	7.79	203	2.90	3.92
APR JUN	10.57	9.48	1.77	1.01	0.84	13.10	9.18	2.43	22.31	51.97	6.22	181	2.59	3.51
JUL SEP	10.59	10.97	2.47	0.76	0.98	15.18	8.90	2.41	21.60	57.07	7.15	184	2.68	3.62
OCT DEC	10.28	10.70	2.31	0.83	1.00	14.81	8.76	2.36	20.71	58.99	6.43	204	2.92	3.94
YEAR	10.60	11.41	2.17	1.13	0.97	15.65	8.94	2.40	21.43	56.39	7.02	193	2.77	3.75
BRADENHAM LAST YEAR	10.04	8.36	1.88	0.93	1.48	12.64	8.77	2.39	21.00	51.01	3.96	202	2.77	3.75
JAN MAR	10.42	7.43	1.47	0.60	1.24	10.74	9.30	2.43	22.60	48.99	6.50	192	2.67	3.61
APR JUN	10.28	6.39	1.38	0.89	1.53	10.19	9.23	2.52	23.29	48.48	6.54	181	2.55	3.44
JUL SEP	10.18	7.05	1.62	0.75	1.62	11.04	9.06	2.42	22.33	49.72	6.42	192	2.68	3.62
OCT DEC	10.59	8.30	1.49	0.71	1.33	11.85	9.34	2.43	22.69	52.21	6.26	190	2.69	3.63
YEAR	10.37	7.31	1.49	0.71	1.43	10.97	9.23	2.45	22.60	49.89	6.43	189	2.65	3.58
WHITEGATE LAST YEAR	10.38	8.26	1.97	1.01	1.94	13.17	9.01	2.42	21.81	53.54	5.61	192	2.72	3.67
JAN MAR	10.42	9.40	2.72	1.11	2.17	15.40	8.86	2.52	22.34	54.08	7.32	181	2.62	3.54
APR JUN	10.56	9.61	1.66	1.20	2.28	14.75	8.01	2.47	22.21	55.63	7.08	191	2.74	3.70
JUL SEP	10.89	8.50	1.47	1.17	1.77	12.91	9.48	2.44	23.14	46.62	7.07	183	2.56	3.46
OCT DEC	10.94	9.20	1.33	1.31	1.86	13.70	9.44	2.35	22.22	49.48	6.28	194	2.69	3.64
YEAR	10.71	9.16	1.79	1.19	2.01	14.15	9.20	2.45	22.53	51.37	6.92	187	2.65	3.58
SPEY LAST YEAR	10.15	8.98	0.72	1.16	1.05	11.91	8.94	2.43	21.70	52.58	3.79	184	2.59	3.51
JAN MAR	10.31	8.40	0.72	1.13	1.38	11.63	9.11	2.44	22.21	58.03	4.59	180	2.63	3.55
APR JUN	10.19	7.16	0.57	1.31	1.09	10.13	9.21	2.30	21.22	57.06	7.17	190	2.76	3.73
JUL SEP	9.89	6.85	0.79	0.92	1.56	12.12	8.69	2.42	21.04	54.11	4.16	180	2.58	3.48
OCT DEC	9.97	7.92	0.86	0.92	1.16	10.84	8.89	2.37	21.03	61.84	5.43	189	2.72	3.74
YEAR	10.09	8.01	0.72	1.06	1.28	11.07	8.97	2.38	21.31	57.94	5.33	185	2.68	3.62
ALL FARMS LAST YEAR	10.13	9.49	1.40	0.84	1.45	13.18	8.80	2.41	21.35	53.80	4.25	193	2.71	3.62
JAN MAR	10.38	10.04	1.55	0.86	1.51	13.96	8.94	2.40	21.41	56.10	5.60	189	2.71	3.66
APR JUN	10.32	8.44	1.21	0.84	1.45	11.94	9.09	2.42	21.86	55.55	6.05	183	2.65	3.50
JUL SEP	10.23	8.76	1.44	0.75	1.47	12.42	8.93	2.41	21.67	54.31	5.42	187	2.66	3.60
OCT DEC	10.37	8.76	1.32	0.80	1.23	12.16	9.10	2.35	21.42	57.86	5.51	191	2.75	3.72
YEAR	10.33	9.00	1.39	0.81	1.42	12.62	9.02	2.40	21.61	56.00	5.64	188	2.69	3.64

* Based on ACTUAL Herd Size @ Standard Pig - 68·5kgs dead @ 74% killing out - 92·5kgs (204lbs) live

1988

1988

FARM	LIVE BIRTHS / LITTER	% MORTALITY					REARED LITTER	LITTERS SOW	REARED* SOW YEAR	FEED CONSUMPTION KG/FINISHED PIG			F.C.R*	F.C.R.
		FARROWING	FLAT DECK	REARING	FATTENING	TOTAL				SOW	CREEP	FATTENING	LIVE	DEAD
BRADUNIAN														
LAST YEAR	10.37	7.31	1.42	0.74	1.43	10.27	2.23	2.45	22.60	49.89	6.43	182	2.65	3.58
JAN MAR	10.13	7.31	1.01	0.71	1.61	11.22	8.22	2.42	22.23	49.66	3.55	204	2.50	3.79
APR JUN	10.10	6.33	1.59	0.76	1.53	10.23	9.07	2.52	22.81	45.83	4.80	184	2.53	3.42
JUL SEP	10.46	7.70	1.08	0.61	1.91	11.30	9.28	2.43	22.53	47.13	3.91	182	2.52	3.40
OCT DEC	10.40	7.06	1.36	0.57	1.81	10.80	9.28	2.37	21.96	50.17	5.62	201	2.78	3.75
YEAR	10.27	7.11	1.51	0.66	1.79	11.06	9.14	2.45	22.39	48.35	4.82	123	2.66	3.59
FELTHILL														
LAST YEAR	10.50	9.45	1.10	0.44	1.36	12.35	2.30	2.42	22.26					
JAN MAR	10.55	9.18	1.40	0.44	0.94	11.96	9.29	2.52	23.37	61.93	5.58	126	2.49	3.31
APR JUN	10.61	11.22	1.13	0.49	0.64	14.31	9.09	2.39	23.47	65.74	5.60	122	2.63	3.54
JUL SEP	10.25	11.52	1.91	0.72	1.17	15.32	8.68	2.36	20.48	57.47	5.75	183	2.12	3.52
OCT DEC	10.15	9.77	1.32	1.09	1.40	13.48	8.78	2.62	23.04	54.47	4.34	186	2.64	3.57
YEAR	10.39	10.62	1.43	0.69	1.04	13.77	8.96	2.52	22.62	61.15	5.32	184	2.71	3.66
MIDTHWOLD														
LAST YEAR	9.53	8.21	0.90	0.44	1.36	10.91	8.49	2.22	18.85					
JAN MAR	9.64	7.3	1.04	1.17	4.58	10.14	8.24	2.61	21.13	69.31	3.66	155	2.38	3.22
APR JUN	10.12	10.43	1.13	0.70	0.49	13.45	8.86	3.22	19.46	67.04	2.31	150	2.37	3.20
JUL SEP	9.82	9.17	1.26	0.58	0.87	12.83	8.56	2.42	20.72	62.34	1.25	174	2.37	3.48
OCT DEC	10.62	10.10	1.01	1.16	0.94	13.21	9.24	2.21	22.38	72.56	4.66	188	2.86	3.87
YEAR	10.07	9.19	1.11	1.14	0.72	12.16	8.84	2.32	20.47	66.31	2.97	167	2.55	3.44
MUNDFORD														
LAST YEAR	10.60	11.41	2.17	1.10	0.97	15.65	8.94	2.40	21.43	56.33	2.02	113	2.72	3.75
JAN MAR	10.31	9.04	2.01	1.35	1.10	13.40	8.93	2.45	21.54	60.07	1.41	214	3.06	4.06
APR JUN	10.38	7.94	1.83	0.69	1.46	11.70	9.16	2.27	20.79	52.38	6.79	188	2.67	3.61
JUL SEP	10.55	9.65	1.78	0.67	1.29	13.19	9.16	2.52	23.09	53.79	4.29	186	2.64	3.57
OCT DEC	10.45	8.45	2.85	0.26	1.13	12.69	9.13	2.29	20.89	58.62	4.38	203	2.87	3.85
YEAR	10.42	8.77	2.12	0.62	1.24	12.75	9.10	2.38	21.65	56.23	6.22	198	2.81	3.80
SEEY														
LAST YEAR	10.09	8.01	0.72	1.06	1.28	11.07	8.27	2.18	21.33	57.94	5.33	185	2.68	3.62
JAN MAR	10.33	6.93	0.47	0.61	1.19	9.20	8.38	2.46	23.09	55.33	5.62	120	2.51	3.39
APR JUN	10.36	5.83	0.78	0.62	1.03	8.42	9.51	2.35	23.37	54.80	5.26	121	2.13	3.69
JUL SEP	10.20	7.35	0.58	0.77	1.02	9.73	9.14	2.32	22.83	51.32	6.10	173	2.51	3.37
OCT DEC	10.70	2.05	0.40	0.70	1.20	11.35	9.48	2.41	23.81	53.63	5.59	178	2.57	3.47
YEAR	10.57	7.30	0.54	0.67	1.12	9.62	9.55	2.39	22.77	53.95	5.64	178	2.56	3.47
WHITEGATE														
LAST YEAR	10.71	9.16	1.22	1.12	3.01	14.16	9.28	2.45	22.63	51.32	6.22	127	2.45	3.58
JAN MAR	10.81	9.01	1.49	1.63	2.32	14.30	9.26	2.46	23.24	50.79	7.51	127	2.76	3.73
APR JUN	10.69	9.31	1.69	1.99	2.09	15.02	9.01	2.39	21.51	59.64	6.59	265	2.92	3.91
JUL SEP	10.86	10.11	2.20	1.71	2.46	16.48	9.02	2.40	21.23	56.49	4.42	167	2.60	3.24
OCT DEC	10.42	10.01	2.96	2.26	2.94	18.17	8.69	2.28	19.78	62.37	6.91	205	3.05	4.10
YEAR	10.72	9.63	2.06	1.90	2.43	16.01	9.01	2.37	21.32	55.82	6.38	194	2.78	3.76
WINCH														
LAST YEAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JAN MAR														
APR JUN														
JUL SEP														
OCT DEC														
YEAR														
ALL FARMS														
LAST YEAR	10.33	9.00	1.32	0.81	1.43	12.43	9.02	2.40	21.61	56.00	5.64	188	2.69	3.64
JAN MAR	10.35	8.15	1.35	0.85	1.33	11.68	9.14	2.47	22.55	58.06	5.92	189	2.73	3.69
APR JUN	10.39	9.02	1.37	0.77	1.11	12.17	9.11	2.48	22.61	57.17	5.26	181	2.69	3.58
JUL SEP	10.47	9.42	1.43	0.92	1.46	13.20	9.09	2.39	21.71	57.26	4.20	178	2.59	3.59
OCT DEC	10.45	9.05	1.42	0.99	1.56	13.02	9.01	2.41	21.86	56.72	5.17	191	2.75	3.72
YEAR	10.42	8.91	1.37	0.88	1.37	12.52	9.11	2.44	22.19	57.43	5.26	185	2.68	3.62

FORM V2

1989

	Live Births/ Litter	Farr.	..PRODUCTIVITY.. % Mortality F.D.	Rearing	Fatt.	Total	Reared Litters Litter	Reared Sow	Reared Sow/Year	FEED CONSUMPTION Kg./Pig. Sow	Creep	Fatt.	F.C.E. Live	F.C.E. Dead
BRADENHAM														
Last year	10.27	7.11	1.51	.66	1.79	11.06	9.14	2.45	22.39	48.25	4.82	193	2.66	3.59
Jan - Mar	10.60	7.46	1.19	.34	1.50	10.49	9.49	2.48	23.53	50.99	5.58	186	2.60	3.42
Apr - Jun	10.31	7.73	1.39	.37	1.57	11.05	9.16	2.41	22.04	58.60	3.94	199	2.88	3.69
Jly - Sep	10.52	8.45	1.03	.27	1.67	11.41	9.32	2.45	22.83	53.05	4.72	192	2.60	3.51
Oct - Dec	10.92	8.41	1.17	.31	1.47	11.37	9.68	2.40	23.25	56.48	6.32	206	2.78	3.75
Year	10.59	8.03	1.19	.33	1.55	11.11	9.41	2.44	22.93	54.68	5.16	195	2.66	3.59
FILTHILL														
Last year	10.39	10.62	1.43	.69	1.04	13.77	8.96	2.52	22.62	61.15	5.32	184	2.71	3.66
Jan - Mar	10.80	11.13	1.28	1.27	1.50	15.18	9.16	2.34	21.46	48.40	3.72	175	2.43	3.20
Apr - Jun	10.48	9.76	1.00	1.39	1.48	13.63	9.05	2.34	21.16	54.08	4.42	203	2.80	3.68
Jly - Sep	10.60	11.13	.86	.91	1.79	14.69	9.04	2.42	21.85	53.93	4.32	194	2.62	3.54
Oct - Dec	10.43	10.08	1.84	1.38	2.24	15.54	8.81	2.42	21.28	56.34	4.72	229	3.03	4.09
Year	10.58	10.54	1.25	1.24	1.76	14.78	9.01	2.38	21.42	54.37	4.39	205	2.74	3.71
HEYBOLD														
Last Year	10.07	9.19	1.11	1.14	.72	12.16	8.84	2.32	20.47	66.31	2.97	167	2.55	3.44
Jan - Mar	10.83	13.43	1.41	1.24	1.21	17.29	8.96	2.33	20.91	102.66	7.03	210	3.43	4.51
Apr - Jun	10.09	12.42	1.40	1.84	1.20	16.86	8.41	2.18	18.34	89.56	4.04	189	3.02	3.98
Jly - Sep	10.09	10.57	1.20	1.22	1.41	14.40	8.64	2.12	18.33	79.98	4.01	180	2.76	3.72
Oct - Dec	9.98	11.42	1.28	1.61	.88	15.28	8.45	2.24	18.96	84.99	3.71	200	3.01	4.07
Year	10.21	11.73	1.33	1.45	1.16	15.67	8.61	2.27	19.51	88.37	4.56	194	2.99	4.05
MORDFORD														
Last year	10.42	8.77	2.12	.62	1.24	12.75	9.10	2.38	21.65	56.23	6.22	198	2.81	3.80
Jan - Mar	9.83	8.51	2.58	.81	1.02	12.92	8.56	2.23	19.98	57.11	3.89	187	2.66	3.50
Apr - Jun	10.19	8.25	1.60	.74	1.44	12.04	8.98	2.24	21.18	65.90	6.05	204	2.95	3.89
Jly - Sep	9.91	9.84	1.82	1.10	1.63	14.39	8.49	2.46	20.83	58.85	4.39	190	2.64	3.56
Oct - Dec	10.64	10.32	1.97	.79	.79	13.88	9.16	2.25	20.62	61.31	7.56	210	2.90	3.92
Year	10.14	9.23	1.98	.86	1.22	13.29	8.79	2.23	20.46	60.66	5.42	197	2.75	3.71
SPEY														
Last year	10.57	7.29	.54	.67	1.12	9.62	9.55	2.39	22.77	53.95	5.64	178	2.58	3.49
Jan - Mar	10.74	7.54	.88	.77	1.12	10.31	9.63	2.37	22.83	55.95	5.08	177	2.55	3.36
Apr - Jun	10.45	7.71	.93	.79	1.13	10.57	9.34	2.39	22.27	57.06	5.33	185	2.65	3.48
Jly - Sep	10.28	9.15	1.05	.40	1.23	11.84	8.99	2.44	21.98	54.74	5.04	177	2.46	3.33
Oct - Dec	10.10	8.17	1.23	.51	1.24	11.14	8.98	2.39	21.47	59.14	6.56	192	2.68	3.63
Year	10.38	8.15	1.02	.62	1.18	10.98	9.24	2.40	22.16	56.66	5.48	182	2.55	3.44
WHITESAIT														
Last year	10.72	9.63	2.06	1.90	2.43	16.01	9.01	2.37	21.32	55.82	6.38	194	2.78	3.76
Jan - Mar	11.23	11.75	2.67	1.82	2.50	18.74	9.13	2.39	21.78	52.90	6.83	197	2.75	3.62
Apr - Jun	11.11	10.02	2.62	1.86	3.19	17.69	9.15	2.34	21.44	53.28	5.91	202	2.80	3.68
Jly - Sep	10.87	9.86	2.42	1.87	2.80	16.94	9.03	2.50	23.58	60.33	6.49	204	2.82	3.81
Oct - Dec	11.53	10.94	2.78	1.16	2.57	17.63	9.10	2.38	23.79	62.33	6.85	212	2.92	3.95
Year	11.06	10.63	2.62	1.68	2.77	17.69	9.10	2.39	21.64	57.18	6.32	204	2.78	3.76
WISCH														
Last year														
Jan - Mar	10.13	11.80	5.70	.46	.80	17.96	8.31	2.40	19.95	106.16	11.99	186	3.25	4.28
Apr - Jun	10.53	7.86	6.71	.03	.91	15.52	8.89	2.19	19.49	54.01	5.36	171	2.47	3.24
Jly - Sep	10.34	6.81	5.08	.80	.67	13.37	8.96	2.33	20.58	63.80	5.65	186	2.66	3.60
Oct - Dec	10.80	8.70	5.82	.52	.49	15.54	9.13	2.31	21.12	65.37	6.91	222	3.06	4.14
Year	10.44	8.77	5.79	.47	.52	15.55	8.82	2.27	20.03	68.40	6.97	191	2.78	3.75
ALL FARMS														
Last year	10.42	8.91	1.37	.88	1.37	12.52	9.11	2.44	22.19	57.43	5.26	185	2.68	3.62
Jan - Mar	10.66	9.95	1.86	.97	1.37	14.15	9.15	2.38	21.78	59.38	5.43	185	2.67	3.52
Apr - Jun	10.47	8.98	1.84	1.03	1.57	13.42	9.06	2.32	21.02	59.95	4.87	194	2.77	3.65
Oct - Dec	10.39	9.65	1.60	.89	1.64	13.77	8.96	2.28	21.25	58.91	4.84	189	2.63	3.55
Oct - Dec	10.58	9.65	2.03	.93	1.51	14.13	9.02	2.34	21.14	62.24	5.60	210	2.90	3.92
Year	10.50	9.57	1.83	.95	1.52	13.88	9.05	2.36	21.38	60.49	5.27	196	2.72	3.68

1990

	Live Births/ Litter	Farr.	% Mortality F.D.	Rearing	Fatt.	Total	Reared Litters Litter	Sow	Reared * Sow/Year	FEED CONSUMPTION Kg./Fin. Pig Sow	Creep	Fatt.	F.C.R. Live	F.C.R. Dead
BRADENHAM														
Last year	10.27	7.11	1.51	.66	1.79	11.06	9.14	2.45	22.39	48.35	4.82	193	2.66	3.5
Jan - Mar	10.60	7.46	1.19	.34	1.50	10.49	9.49	2.48	23.53	50.99	5.58	186	2.60	3.4
Apr - Jun	10.31	7.73	1.39	.37	1.57	11.05	9.16	2.41	22.04	58.60	3.94	199	2.80	3.6
Jly - Sep														
Oct - Dec														
Year														
FELTWELL														
Last year	10.39	10.62	1.43	.69	1.04	13.77	8.96	2.52	22.62	61.15	5.32	184	2.71	3.66
Jan - Mar	10.80	11.13	1.28	1.27	1.50	15.18	9.16	2.34	21.46	48.40	3.72	175	2.43	3.20
Apr - Jun	10.48	9.76	1.00	1.39	1.48	13.63	9.05	2.34	21.16	54.00	4.42	203	2.80	3.68
Jly - Sept														
Oct - Dec														
Year														
METHWOLD														
1st Year	10.07	9.19	1.11	1.14	.72	12.16	8.84	2.32	20.47	66.31	2.97	167	2.55	3.44
Jan - Mar	10.83	13.43	1.41	1.24	1.21	17.29	8.96	2.33	20.91	102.66	7.03	210	3.43	4.51
Apr - Jun	10.09	12.42	1.40	1.84	1.20	16.86	8.41	2.18	18.34	89.56	4.04	189	3.02	3.98
Jly - Sep														
Oct - Dec														
Year														
MUNDFORD														
Last year	10.42	8.77	2.12	.62	1.24	12.75	9.10	2.38	21.65	56.23	6.22	198	2.81	3.80
Jan - Mar	9.83	8.51	2.58	.81	1.02	12.92	8.56	2.33	19.98	57.11	3.89	187	2.66	3.50
Apr - Jun	10.19	8.26	1.60	.74	1.44	12.04	8.98	2.24	21.10	65.90	6.05	204	2.95	3.89
Jly - Sep														
Oct - Dec														
Year														
SPEY														
Last year	10.57	7.30	.54	.67	1.12	9.62	9.55	2.39	22.77	53.95	5.64	178	2.58	3.49
Jan - Mar	10.74	7.54	.88	.77	1.12	10.31	9.63	2.37	22.83	55.95	5.08	177	2.55	3.36
Apr - Jun	10.45	7.71	.93	.79	1.13	10.57	9.34	2.39	22.27	57.00	5.33	185	2.65	3.48
Jly - Sep														
Oct - Dec														
Year														
'ITEGATE														
Last year	10.72	9.63	2.06	1.90	2.43	16.01	9.01	2.37	21.32	55.82	6.38	194	2.78	3.76
Jan - Mar	11.23	11.75	2.67	1.82	2.50	18.74	9.13	2.39	21.78	52.90	6.83	197	2.75	3.62
Apr - Jun	11.11	10.02	2.62	1.86	3.19	17.69	9.15	2.34	21.44	53.38	5.91	202	2.80	3.68
Jly - Sep														
Oct - Dec														
Year														
WINCH														
Last year														
Jan - Mar	10.13	11.80	5.70	.46	.00	17.96	8.31	2.40	19.95	106.16	11.99	186	3.25	4.28
Apr - Jun	10.50	7.86	6.71	.03	.91	15.52	8.89	2.19	19.49	54.01	5.36	171	2.47	3.24
Jly - Sep														
Oct - Dec														
Year														
ALL FARMS														
Last year	10.42	8.91	1.37	.88	1.37	12.52	9.11	2.44	22.19	57.43	5.26	185	2.68	3.62
Jan - Mar	10.66	9.95	1.86	.97	1.37	14.15	9.15	2.38	21.78	59.39	5.43	185	2.67	3.52
Apr - Jun	10.47	8.98	1.84	1.03	1.57	13.42	9.06	2.32	21.02	59.95	4.87	194	2.77	3.65
Jly - Sep														
Oct - Dec														
Year														

Unit Physical Data for Control Farm

Pigs reared per sow per year

	1985	1986	1987	1988	1989
Hardings	22.68	23.23	20.58	17.40	16.39
Scholes	16.33	17.50	21.02	21.35	19.75

Total mortality %

	1985	1986	1987	1988	1989
Hardings	16.9	15.1	17.2	15.4	16.1
Scholes	14.9	13.1	15.2	14.1	14.2

Breeding Unit Mortality %

1985	1986	1987	1988	1989
Hardings	11.1	12.1	13.0	14.5	16.1
Scholes	12.3	12.5	11.5	11.6	11.1

Litters born per sow per year

2.1	2.3	2.1	2.0	1.9
1.9	2.0	1.9	2.1	2.2

APPENDIX E

PIG HEALTH & DISEASE TOPICS - Questionnaire for Course attenders

You have just attended a two day course on pig health and diseases and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

1. Do you have time to spot potential health problems with the pigs? Yes/No _____ (please state if you have sows, weaners rearers, or finishers).

If 'Yes' then what are the most common signs of ill-health in your herd? for example appetite, dung, discharge, or any other reason _____
_____

If 'No' then how do you deal with unhealthy pigs? _____
_____
_____

2. Do you think that you now have more knowledge to spot the unhealthy pig? (Please score your assessment of your knowledge before and after the course using a 'X' on the line between 0 and 5)

```
          0                5
          *----------------*  before the course
          *----------------*  after the course
```

3. Do you take precautions to reduce disease getting into the unit? Yes/No

If 'Yes' then what precautions do you take? _____
_____
_____

If 'No' then why not? (Too costly , too fussy, no legal or contract requirement)_____
_____

4. Do you now understand how disease gets into the pigs themselves? Yes/No

5. What happens to the pig after infections ? (please tick any of the following if you think they are correct)

Does it become immune ?
Does it suffer stress ?
Does it pass on inherited resistance to offspring ?
Do the bugs wait for stress to trigger the disease again ?

6.What level of priority are you able to give or would wish to give the following items; (Need for Action ✓or X Priority - High ✓✓✓ some ✓✓ Low ✓)

Reduction in level of disease
Reduction in the level of stress
Reduction in navel problems
Reduction in the level of wounds
increase in level of hygiene
Increases in disinfection -
Increase in use of footbath

Need for Action	Priority

7. One session discussed the spread of disease. Would you please assess your unit for the following items. You can put in brackets on the form any comments eg.I have asked for new needles but Boss won't let me have any!!!

	Poor	Fair	Av.	Good	Excellent
Where does disease come from ? a)How good is floor for reducing spread of disease ?					
b)How clean are the pens?					
c)How good is the power washer?					
d)How good is the vermin control?					
e)How hygienic are your injection needles ?					
f)How good are the facilities for storage of vet materials?					
g)How good is the ventilation in the buildings ?					
h)How good is the temperature control in the unit ?					

	Very Low	Low	Fairly High	High	Very High
i)What is the level of stress for your pigs?					
j)What level of wounds occur (tail-biting, bullying, etc.) ?					
k)What level of navel problems occur ?					
l)What level of immunity do you think the pigs have to most diseases ?					
m)What priority do you have to give to general hygiene ?					

8. Do you perform any of the following operations on the unit ? Yes or No. (after each operation would you please give yourself a score between 1 and 10)
   eg. Do you drench pigs? Yes/~~No~~ (6)

Do you castrate pigs ? Yes/No ( )
Do you inject pigs ? Yes/No ( )
Do you tail dock the pigs? Yes/No ( )
Do you teeth clip the pigs? Yes/No ( )
Do you use ear tattooing ? Yes/No ( )
Do you foot trim the sows? Yes/No ( )

9."Resistance to disease is reduced by stress." What factors increase stress in the list below ? (tick correct factors)

	TICK	LIST IN ORDER
a) crowding		( )
b) weather		( )
c) draughts		( )
d) food		( )
e) wet bed/ water		( )
f) group size		( )
g) transporting		( )
h) fighting		( )
i) sudden diet change		( )
j) mixing groups		( )

PUT THIS LIST OF FACTORS IN THEIR ORDER OF IMPORTANCE USING ( )

10. Assess your level of knowledge and skill on the following topics using the scales provided.

Importance of observation	0---------5	Before
	0---------5	After
Importance of reducing stress	0---------5	Before
	0---------5	After
Reducing the spread of disease	0---------5	Before
	0---------5	After
Appreciate importance of immunity	0---------5	Before
	0---------5	After
Appreciate benefits of closed herd	0---------5	Before
	0---------5	After

11. Have you completed the action plan?
12. Will you discuss this plan with your Boss or Manager?

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

CONDITION SCORING – Questionnaire for Course Attenders

This is a short questionnaire to assess the effectiveness of the course that you have just attended. The information that is recorded on this form will be **COMPLETELY CONFIDENTIAL** to myself and only used in my thesis in an anonymous form. Thank you for agreeing to answer the following questions.

1.Had you ever considered condition scoring the sows? Yes/No
If 'Yes' did you realise the benefits of condition scoring? Yes/No. If 'No' then what do you think of the system? Good idea, no use on my unit, no time to do the scoring, manager would take no notice anyway._____

(please cross out if not applicable and add any further comments)

2.Which of the following benefits will help your unit? (Cross out where not relevant)

Lower culling rate
Increased culling for reproductive failure
Increased average herd age
Increased sow productivity
Controlled feed distribution

3.Can you condition score your sows now? Yes/No

4.How many of your scores were correct compared to the instructor? __ out of __ .eg (8 out of 10).

5.How confident are you of condition scoring correctly? Please put your own assessment of your ability to score on the following scale

```
                    0                   5
                    *-----------------* after the course
                    *-----------------* before the course
```

(if you had no experience before then score 0 and comment no experience)

6. Are you convinced that condition scoring will help you to minimise fluctuations in condition during the breeding cycle? Yes/No.
If 'Yes' then what will you do to combat the problem? (Tick the following if they are applicable)

Look very closely at feeding
Check the feed required at stages of breeding cycle
Check the temperature in the house
Check the weight of the animal

If 'No' then do you think that fluctuations in condition have any effect on breeding? Yes/No (if not why not?) _____

7."Feeding seems to be the key to condition and sow productivity". Do you feel that you can now feed correctly to achieve the required condition? Please score your feeding skills on the scale provided.

```
                          0                   5
after the course          *-----------------*
before the course         *-----------------*
```

8.Please look at the short checklist of items below and assess the usefulness of the condition scoring method to your pig unit on the scale "poor" to "excellent".(place a tick under the required heading)

	Poor	Fair	Av.	Good	Excellent
a.How easy was it to pick up the method?					
b.How good was your condition scoring?					
c.How easy was it to use the condition scoring charts?					
d.What are the chances of using this method at work?					
e.What are the chances of changing feed rations based on condition scoring?					

9.After attending this course you may have identified key areas where action is required to introduce the new knowledge and skills that you have acquired. Please tick the following list using the scoring key provided.

SCORING KEY

Need for Action
✓ action needed
✗ no action

Priority/Urgency
1. High Priority/ very urgent ✓✓✓
2. Some urgency ✓✓
3. Little urgency ✓

Benefits of condition scoring	Need for Action	Priority/Urgency
eg	✓	✓✓
a.The need to introduce condition scoring		
b.Controlling food usage when related to sow scores		
c.Better control of culling rate		
d.To increase sow productivity		
Pigs born per litter		
Piglet survival		
Sow milk yield		
Regular breeding		
e.Method of feeding to give a target score/weight.		
f.Improved environmental control		
g.Regular adjustment to feed without delay		
h.Regular checking of leg & body injuries		
i.Aim for sow scores of 3.5 + 0.5		

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

INFERTILITY IN PIGS - Questionnaire for Course Attenders

You have just attended a course on "Causes, Prevention and Treatment of Infertility in Pigs" and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stoskmen like yourselves.

(Please cross out the response to a question that does not apply)

1. Please tick if the following items are the main causes of depressed (low) fertility and tick again if they are a problem in your herd.

	General Cause	Problem in our unit
Lack of oestrus		
Return to service at 3 weeks		
Return to service after 3 wks.		
Abortion		
Small litters		
Still births & mummification		
Not farrow although seem in-pig		

2. Can any of these problems be sorted out on your unit? Yes/No. If "Yes" then which problem and how can you solve it ?

	Problem	Solution
a)		
b)		
c)		

3. Would you please tick the factors that you are sure that you can influence on your unit. Would you then assess your confidence level to achieve success in all these areas.

	TICK	CONFIDENCE LEVEL Between 0 and 10
Correct supervision of services or AI		( )
Correct feeding of sows		( )
Correct weaning procedure		( )
Boar use and management		( )
Eliminate stress - fighting,bruising crushing; good floors		( )
Worming/Mange Dressing		( )
Culling Policy		( )
Ensuring gilts are served at correct time		( )
Environment -		( )
seasonal changes in fertility due to		
a) weather - environmentally controlled house		( )
b) light		( )
c) service area		( )
d) temperature		( )

Please put a "*" next to any factors that you cannot affect due to Company policy or maybe the unit manager or the unit design.

4. How do you find out if it is the boar or sow which is contributing most to infertility ?_____

5. Individual sow fertility may be affected by the following diseases. (Tick the correct answers).

Hormones	TICK
Infection of the liver	
Poisoning due to moulds, ergot	
Illness - low temperature	
Arthritis, Vaginitis, Cervitis	

6. The problem may be due to the **BOAR PERFORMANCE.** Please check the following list and **tick if correct** and then assess your unit with regard to the importance of the problem **on a scale from** 0 - 5 where 0 = no problem to 5 = great problem.

	TICK	PROBLEM SCORE
Failure to feed properly		( )
Need to serve each sow three times		( )
Is the sow really on heat?		( )
Does sow smell of another boar		( )
Boar recently fed		( )
Boar overworked - boar:sow ratio		( )
Boar infertile		( )

7. Which diseases have had the most marked effect upon overall herd fertility? (Tick **the diseases that answer this question** and then state whether your unit has had any problems with the disease)

	TICK	PROBLEM
Parvo Virus (SMEDI)		
Erysipelas		
Rhinitis		
Aujeszky's		

8. How would you control an outbreak of SMEDI ? (tick the **appropriate measures introduced)**

	TICK
Build up immunity in the herd	
Feed foetal material but at the correct time in breeding cycle	
Lack of stress and good management	
System to introduce purchased gilts	
Don't buy "in-pig" gilts	
Vaccinate	

9. "Poor fertility is a major factor in reducing unit physical and financial performance." Which steps can management take to improve the performance ? Please **tick the factors that need action** to be taken on your unit and then **assess the priority** ? Would you please assess your own ability to influence these factors given the chance (use the scale 0 to 5). Action Low Medium High Priority

	Action/No Action	Priority Score
eg. Service record		
Environment		
Service procedures		
Reduction in stress		
Correct feeding		
Records which can be used by vet to monitor performance		
Stockmanship/observation - attention to detail		
Correct use of vet		
Correct procedure to prevent or contain disease		

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

BOAR CARE & EFFECTIVE SERVICE - Questionnaire for Course Attenders

You have just attended a course on Care of Boars and Effective Service and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

1. The boar is 25%, 50%, 75% of the herd in terms of importance. (cross out the % not applicable).

2. Please complete the following paragraph (usually only one word required).

The service pen design is very important and the size should be ____ sq.ft. with only a few _____ . The area should be well ventilated but _____ free. The floor should be well _____ , non-_____ , insulated with _____ , if it is available, on the floor, otherwise slatted floors will do. Partitions should be __ ft tall and gates barred _____. Troughs and drinkers should not stick out from the wall. Good lighting is vital.

3. The boar should be brought into the sow pens ? True/False

4. Boars should never be switched due to scent changes ? True/False

5. Boars should not be fed less than 16% protein rations? True/Fals

6. Boars older than lyr.should receive 8-10lb food per day? T /Fals

7. The physical condition of boar should be "well fed and contented" ? True/False

8. The following health problems are important to ensure a hard working and effective boar. Which problem occasionally affects your boar? (tick the problem areas and rank in order of importance)

a) feed problems	( )
b) mange	( )
c) worms	( )
d) loose dung	( )
e) erysipelas	( )

9. Please assess your skills at the following tasks after the course; (circle the level of skill that you think applies to you)

	No Experience					Fully experienced
a) Do you take temperatures ?	0	1	2	3	4	5
b) Do you do any foot-paring ?	0	1	2	3	4	5
c) Do you inject sows & boars with vet's guidance ?	0	1	2	3	4	5
d) Do you footbath sows/boars ?	0	1	2	3	4	5
e) Do you condition score sows?	0	1	2	3	4	5

10. How many sows per boar should be OK ? _____

11. How many services a week should be OK for a boar over 12 months of age ? 2-3, 3-4, 4-5, 5-6, 6-7.

12. Given the following data ,
1000 sow herd
2 litters per year
40 service boars averaging 3 services per mating
Calculate: how many times (average) will each boar be used per week ?_____

13. How good are you at detecting heat? Average Excellent
(please put a cross on the line) 5----------10

14. What % returns of service occur in your herd ? _____

15. Do you supervise the mating ? Yes/No
If "Yes" do you have to assist to "aid penetration" and ensure an effective service (tick the appropriate column for the class of stock shown)

	Never	Sometimes	Fairly Often	Regularly	All the time
Young boars (less than 1 yr.)					
Boars 1-2yrs old					
Boars 2-3yrs old					
Boars over 3yrs old					

15. What problems do you find with young boars if any? _____
_____
_____

16. Are the service facilities adequate on the unit ? Yes/No
If "No" then what problems do you find ? Poor pen design, size, too many corners, floor is poorly drained/ surfaced/ insulated, partition is too low, troughs and drinkers stick out of the wall. (Cross out the incorrect answers for your unit).

17. Is it easy to ensure a safe and effective use of the boar? Yes or No. Were you aware of the danger from boars? Yes/No.

18. How many of the following safety guidelines do you use? (Tick the guidelines that you try to use)
a) Never trust a boar
b) Get to know boars at an early age
c) Establish a routine
d) Be gentle but firm
e) Don't take him past other boars
f) Always use a boar board
g) Two people to clean out boar pen
h) Use a guillotine crush for constraint
i) Clean out when feeding
j) Know your escape route
k) Use of "teaser" boar encourages frustration and aggression

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

AIMING AT MAXIMUM CONCEPTION - Questionnaire for Course Attenders

You have just attended a course on Aiming at Maximum Conception and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

1. List the productive and unproductive periods of sows and gilts.

PRODUCTIVE	UNPRODUCTIVE
(a)_____	(a)_____
(b)_____	(b)_____
(c)_____	(c)_____

2. You have just completed some calculations.
   How confident are you in doing these calculations? (Please score yourself on a range 0 to 10 using a cross before and after the course)
   CONFIDENCE before the course 0 ----------10
   CONFIDENCE after the course 0 ----------10

3. Do you know the physical results for your own unit? Yes/No
   Please note down any figures about your unit.

_____
_____

4. How many days should it take from weaning to get the sow back in pig?
   Answer _____ days

5. What do you understand by "DAYS WASTED" ? _____
   _____

6. What is that loss worth in terms of productivity ? Loss of ___litter

7. What is the current value of a weaner ? £____

8. What would that loss be worth to you on your unit? £_____

9. What are the causes for the long weaning to service interval ?
   (Please Tick the causes that are a concern on your unit and state the level of concern)

	Tick	No concern	Low concern	Average concern	High concern
eg. Silent heat					✓
Anoestrus	--		-----		
Heat undetected					
Sow fails to conceive					
Served too late					
Embryonic losses /abortion					
Delay between weaning & culling					

10. The most usual reasons for long weaning to service time are:
    Failure to come in oestrus promptly and
    Failure to detect heats
    Indicate on the scale your confidence **Before** 0----------10
    the course to detect heat in sows.
    After the course 0----------10

11. Poor ovulation and low boar fertility are two major causes of a low conception rate . How can you as a stockman reduce this problem?

(a) Affect the pattern of boar use to give high sperm numbers, viability & motility. HOW?_____

_____

_____

(b) Recognise the ideal time for copulation. How would a good stockman recognise the ideal time for mating? _____

_____

_____

12. Would you please score your level of knowledge concerning maximising conception , to increase the level of successful services leading to high conception rates. (Please score on the scales given with an "x" to show your level of knowledge before and after the course)

		No Knowledge	Very Knowledgable
eg Assess boar fertility	Before	0	10
	After	*	*
The causes of high "WASTED DAYS"	Before	0	10
	After	*	*
The calculation of "WASTED DAYS"	Before	0	10
	After	*	*
The cost of loss of production due to "WASTED DAYS"	Before	0	10
	After	*	*
The detail of the reproductive process	Before	0	10
	After	*	*
The factors affecting boar fertility	Before	0	10
	After	*	*
The ideal time for copulation	Before	0	10
	After	*	*
The need for so many sperms	Before	0	10
	After	*	*
The working of the oestrus cycle	Before	0	10
	After	*	*
The need for good observation & management	Before	0	10
	After	*	*

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PRACTICAL GILT SELECTION - Questionnaire for Course Attenders

You have just attended a course on Practical Gilt Selection and a short questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

1. Too many sows die or have to be culled before they become profitably productive. How many sows on your unit are culled before they reach 4 - 6 litters? 2%, 10%, 20%, 25%. (Circle the closest figure)

2. How many litters do you normally cull sows? 4, 5, 6, 7, 8. (Circle the answer that is either the unit policy or normally occurs)

3. What is the main reason for culling sows? (tick the answers and tick again the main reasons for culling on your unit- assess on a scale 0-5)

	TICK problem	TICK problem for your unit
Lameness		
Mis-mothering		
No milk/ shortage		
Old age		
Paralysis		
Poor progeny		
Reproductive failure		
Udder problem		
Mange		
Tail- biting		

4. Which of these reasons is under the control of the stockman?
_____
_____

5. List FOUR factors that influence herd replacement policy. _____
_____
_____
_____

6. What is the herd replacement policy for your unit? _____
_____
Do you have a target culling age or rate?

7. Do you use condition scoring to assess the culling of a sow? Yes/No
Do you use unit record to assess a sow for culling? Yes/No

8. How would you change unit policy on culling rate? After discussion and considering all the factors or you cannot influence it. (underline the appropriate answer) _____ _____
_____

9. What would you look for in the selection of gilts?(Tick the important factors and score your ability to assess these features on a scale 0-6)

	Performance TICK	0-6	Appearance TICK	0-6
	Parents of gilt	( )	Fatness of the carcase	( )
S	Weight for age	( )	Sound legs	( )
	MLC Test index of merit	( )	"Weakness" in conformation	( )
	F.C.R.	( )	Poor stance	( )
	Temperament	( )	Six-teats each side	( )

10. How can genetic improvement work on your unit? _____
_____
Is the improvement due to new boars (Yes/No), new improved gilts being purchased from hybrid stock producers (Yes/No), improved food conversion ratios (Yes/No), or better visual selection (Yes/No)?

11. With the gilts for demonstration ,what were the visual features that were recorded to justify their purchase (or retention of the home-bred stock).

a._____
b._____
c._____
d._____
e._____

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

DISEASE CONTROL & PREVENTION - Questionnaire for Course Attenders

You have just attended a course on Disease Control and Prevention and a short questionnaire has been prepared to assess the benefits of training.

This form is TOTALLY CONFIDENTIAL and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for the experienced stockman like yourselves.
(Please cross out the response to a question that does not apply)

1. What is the cost of disease to pig producers? (Please TICK if relevant and number in order of importance 1 - 5)

	TICK	Order of Importance
Deaths of pigs/sows/boars		( )
Loss of liveweight gain		( )
Poor food conversion ratio		( )
Lower breeding performance		( )
Increased drug costs		( )

2. Are drugs the answer to your disease problems? Yes/No
   If "No" then why not? _____
   _____

3. What are the ways in which you could minimise disease risk to less than 10% ? (Tick the problem on your unit that could be improved and score the problem in order of importance for solving)
   eg. Vaccination ( ) (2)

	TICK	Order of imp. for solving
Building design	( )	( )
Hygiene/Disinfection	( )	( )
Introduction of new stock	( )	( )
Medication	( )	( )
Use of vet records	( )	( )

4. How can you avoid disease being brought into your unit? (Tick whether you use any of these procedures or tick if you think some are needed on the unit)

	In use on the unit already	Needed on the unit
eg "No Visitors" sign	( )	( )
Perimeter fence	( )	( )
Wheel dip for vehicles	( )	( )
Foot dip for visitors	( )	( )
Boots/overalls for essential visitors	( )	( )
Loading ramp outside unit	( )	( )
Feed lorries unload from outside the unit	( )	( )
Anti-bird and rat precautions	( )	( )

5. How can you prevent the spread of disease within the unit?
   (Tick the procedures that you already use on the unit and tick inthe second column those procedures that should be introduced)

	Already in use	Should be used
Avoid scaping through the unit	( )	( )
Proper disinfection and hygiene	( )	( )
Proper disposal of dead pigs	( )	( )
Isolation pens away from buildings	( )	( )
Proper storage of vet items/medicine/needles	( )	( )
Sterilisation of vet & AI equipment	( )	( )
Power washing facilities	( )	( )
Sensible flow of pigs through unit	( )	( )
Use of easily cleaned materials	( )	( )

6. Were you surprised at the weight of dead material on the site for disposal? Yes/No

7. Are you able to calculate the dead material produced by a 100 sow herd, producing fat pigs? Yes/No

8. Could you calculate the dead material produced by your own unit from data collected now? Yes/No

9. What system of disposal do you use on your unit? (Tick the relevant method used please)

Burial by hand	( )
Burial by mechanical digger	( )
Knacker man or hunt	( )
Burial in dung heap	( )
Incineration	( )
Carcase disposal pits	( )

10. "Hygiene is very important" What are the most important stages in cleaning and disinfecting a farrowing house or finishing house?

	TICK
Remove demountable equipment	
Soak walls, floors, fixed equipment	
While soaking, roughly pre-clean equipment	
Sanitise drinking system, water bowls, etc	
Power hose walls, floor, etc	
Disinfect pens starting from top to bottom	
Disinfect equipment	
Let dry	
Check electrics, gas, ventilation	
Rest building if possible	

11. List precautions that can be taken to minimise the risk of "importing" disease in new breeding stock in order of importance.

(1)_____

(2)_____

(3)_____

12.Do you keep records and use them for reference? Yes/No

13.What use should we make of records? Assess your level of confidence at using the records to do the following score 0 - 5

	0 5	
Planning/Checking production	*----------*	Before
	----------	After Course
Reproduction data	*----------*	Before
	----------	After Course
Monitoring disease	*----------*	Before
	----------	After Course
Check food conversion ratios	*----------*	Before
	----------	After Course

14. In what other ways can I make use of my vet to increase efficiency and profitability? List some areas of advice that you can obtain from the vet.

_____

_____

_____

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders
==========

During the Winter 1987/88 you attended one or more courses on pig topics and a questionnaire has been prepared to assess the benefits of this training.

This form is TOTALLY CONFIDENTIAL and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

REDUCING PIGLET MORTALITY
==========

1. Is piglet starvation a problem on your unit? YES/NO If "YES" then what action do you take to prevent it?
TICK the list below if you follow any of these procedures.

List A	TICK	List B	TICK
Cross fostering		Batch farrowing	
Colostrum in 6 hours		Supplementary feeding	
Commercial milk powder		Hand rearing	
Check the number of teats		Shift suckling	

2. How do you ensure that the sows have adequate milk supplies ?
Check the list below and TICK those measures that you use on your unit. Assess your confidence to use these measures on a scale of 0 ---- 5 before and after todays session. Use an "X" on the scale.

	TICK	SCALE of CONFIDENCE	
Correct feeding in pregnancy		Before	0----------5
		After	0----------5
Correct management to avoid MMA		Before	0----------5
		After	0----------5
Condition scoring		Before	0----------5
		After	0----------5
Culling policy		Before	0----------5
		After	0----------5

3. How important is fostering on your unit? Very/ Sometimes/ Not used
Circle the one that is correct.

4. What percentage of piglet deaths are due to starvation? _____%
What is the answer for your unit? _____%

5. What percentage of piglet deaths are due to crushing? _____%
What is the answer for your unit? _____%

6. Are you or the manager satisfied with the farrowing crate and pen design? Yes/No If "No" then do you have the following problems

Farrowing Pen Design	TICK
Size of the crate and way sow lies	
Design of the slats	
Position of the creep	
Overall environment - draughts	
- insulation	
- ventilation	
- temperature	
Type of feeder and drinker	

7. Are you responsible for farrowing pen management ? Yes/No If the answer is "Yes" then what do you consider to be the THREE most important areas of farrowing pen management which can minimise losses in the farrowing unit (List in order of priority)_____
a)_____
b)_____
c)_____

8. Please assess your level of knowledge and confidence in the farrowing house using the following rating scales;

KNOWLEDGE Level on Causes of piglet mortality	Before course	0----------5
	After course	0----------5
CONFIDENCE Level on improving farrowing conditions	Before course	0----------5
	After course	0----------5

9. What action would you take to eliminate the factors which cause an outbreak of E. Coli ? Choose from the list below and indicate any that you use on your unit.

	TICK	TICK (used on your unit)
Reduce stress		
Warm, dry housing		
Closed herd		
Vaccinate sows/gilts		
All in/All out policy		
Calm handling		

10. How confident are you at recognising and dealing with an outbreak of E. Coli. Please score your ability on the scales below.

KNOWLEDGE level to recognise symptoms	Before course	0----------5
	After course	0----------5
CONFIDENCE level to deal with disease	Before course	0----------5
	After course	0----------5

11. Would you please assess your confidence to recognise the problems and ability to deal with them -- before you came on the course and afterwards.(Score 0 - cannot recognise to 5 - easily recognise and 0 to 5 on ability to deal with problem before and after course)

	(0 -- 5)Recognise	(0 -- 5)Ability	
		Before	After
Splay legs	( )	( )	( )
Sealed anus	( )	( )	( )
Bleeding navels	( )	( )	( )
Scour	( )	( )	( )
Meninigitis	( )	( )	( )
Joint ill	( )	( )	( )
Anaemia	( )	( )	( )

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

APPENDIX F

THE UNIVERSITY OF NOTTINGHAM

Telephone: KEGWORTH (STD 05 097) 2386

Head of Department:
Professor J. D. IVINS, M.Sc. Ph.D., F.R.Ag.S.

DEPARTMENT OF
AGRICULTURE AND HORTICULTURE
SCHOOL OF AGRICULTURE
SUTTON BONINGTON
LOUGHBOROUGH
LE12 5RD

February 1990

Dear

On you attended a course on
led by
Alan Lightfoot. With the permission of Breckland Farms, I am trying to measure the success of this course.

If you would please complete the enclosed questionnaire, it will be used in a research study for Nottingham University.

Any information given will be COMPLETELY CONFIDENTIAL and ONLY used in the study.

I hope that you can spare a few moments of your valuable time, and return the form in the envelope provided.

Thank you.

Yours sincerely

Derek J. Girdler.

DEREK J GIRDLER
Consultant Training Adviser

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders
==========

During the Winter 1988/89 you attended one or more courses on pig topics and a questionnaire has been prepared to assess the benefits of this training.

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(Please cross out the response to a question that does not apply)

INFERTILITY IN PIGS

1. Many of the following factors influence fertility in pigs and may be controlled by the stockman. Would you then assess your confidence level to achieve success in these areas both before and after the course (Give yourself a score between 0 and 10)

	CONFIDENCE LEVEL	
	Before	After the Course
Correct supervision of services or AI	( )	( )
Correct feeding of sows	( )	( )
Correct weaning procedure	( )	( )
Boar use and management	( )	( )
Eliminate stress - fighting,bruising crushing, good floors	( )	( )
Worming/Mange Dressing	( )	( )
Culling Policy	( )	( )
Ensuring gilts are served at correct time	( )	( )
Environment -	( )	( )
seasonal changes in fertility due to		
a) weather - environmentally controlled house	( )	( )
b) light	( )	( )
c) service area	( )	( )
d) temperature	( )	( )

2. The problem may be due to the BOAR PERFORMANCE. Please check the following list and tick if correct and then assess your unit with regard to the importance of the problem on a scale from 0 - 5 where 0 = no problem to 10 = great problem.

	TICK	PROBLEM SCORE
Failure to feed properly		( )
Need to serve each sow three times		( )
Is the sow really on heat?		( )
Does sow smell of another boar		( )
Boar recently fed		( )
Boar overworked - boar:sow ratio		( )
Boar infertile		( )

3. Which diseases have had the most marked effect upon overall herd fertility? (TICK the diseases that answer this question and then state whether your unit has had any problems with this disease)

	TICK	PROBLEM
Parvo Virus (SMEDI)		
Erysipelas		
Rhinitis		
Aujeszky's		

4. How would you control an outbreak of SMEDI ? (TICK the appropriate measures introduced)

	TICK
Build up immunity in the herd	
Vaccinate	
Lack of stress and good management	
Don't buy "in-pig" gilts	
System to introduce purchased gilts	

5. How confident are you that you could recognise and deal with the following diseases ? (Please assess you level of knowledge and confidence to sort out these problems - give yourself a score between 0 and 5)

	KNOWLEDGE		CONFIDENCE	
	Before Course (0-5)	After (0-5)	Before Course (0-5)	After (0-5)
Erysipelas	( )	( )	( )	( )
Rhinitis	( )	( )	( )	( )
Aujeszky's	( )	( )	( )	( )
Parvo Virus (SMEDI)	( )	( )	( )	( )

6. "Poor fertility is a major factor in reducing unit physical and financial performance." Which steps can management take to improve the performance ? Please tick the factors that need action to be taken on your unit. Would you please assess your own ability to influence these factors given the chance on a scale from 0 to 5 (Please consider your ability before and after the course)

	ABILITY SCORE	
Action	Before	After the Course
eg. Service record		
Environment	( )	( )
Service procedures	( )	( )
Reduction in stress	( )	( )
Correct feeding	( )	( )
Records which can be used by vet to monitor performanc	( )	( )
Stockmanship/observation - attention to detail	( )	( )
Correct use of vet	( )	( )
Correct procedure to prevent or contain disease	( )	( )

7. Individual sow fertility may be affected by the following problems. (TICK the correct answers)

	TICK
Hormones	( )
Infection of the liver	( )
Poisoning due to moulds (ergot)	( )
Illness - low temperature	( )
Arthritis, Vaginitis, Cervitis	( )

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

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(Please cross out the response to a question that does not apply)

AIMING AT MAXIMUM CONCEPTION

1. How many days should it take from weaning to get the sow back in pig?
Answer _____ days

2. What do you understand by "DAYS WASTED" ? _____
_____

3. What is that loss worth in terms of productivity? Loss of ___/litter

4. What is the current value of a weaner ? £_____ per 25Kg Weaner

5. How confident are you at calculating the number of productive days?

CONFIDENCE	before course	0----------5
	after course	0----------5

6. The most usual reasons for long weaning to service time are:
Failure to come in oestrus promptly and
Failure to detect heats
Indicate on the scale your confidence Before 0----------10
the course to detect heat in sows.
After the course 0----------10

7. Would you please score your level of knowledge concerning maximising conception , to increase the level of successful services leading to high conception rates. (Please score on the scales given with an "x" to show your level of knowledge before and after the coursc)

		No Knowledge ... Very Knowledgable
eg Assess boar fertility	Before	0----------10
	After	*----------*
The causes of high "WASTED DAYS"	Before	0----------10
	After	*----------*
The calculation of "WASTED DAYS"	Before	0----------10
	After	*----------*
The cost of loss of production due to "WASTED DAYS"	Before	0----------10
	After	*----------*
The detail of the reproductive process	Before	0----------10
	After	*----------*
The factors affecting boar fertility	Before	0----------10
	After	*----------*
The ideal time for copulation	Before	0----------10
	After	*----------*
The need for so many sperms	Before	0----------10
	After	*----------*
The working of the oestrus cycle	Before	0----------10
	After	*----------*
The need for good observation & management	Before	0----------10
	After	*----------*

8. There are many factors that affect the success of a mating. TICK the items on the list below that have an influence upon sperm numbers, viability and motility.

	TICK
Effect of temperature	
Over use of boar	
Under use of boar	
Reduced fertility	
Congenital abnormality	
Age of boar	

9. "A GOOD STOCKMAN CAN TELL WHEN A MATING SHOULD TAKE PLACE". What would the person see? TICK the following replies if they are correct and TICK again if they are signs that you used before the course.

	TICK	TICK (used before course)
Ear movement		
Noises of welcome		
Salivation		
Urination		
Dunging		
Sniffing		
Standing		
Back arching		

10. Do you now feel that you have increased your level of knowledge and skills in the area of improving conception rates? YES/NO
If "YES" then please rate your overall improvement on the scales below.

KNOWLEDGE level Before 0----------10
After 0----------10

SKILLS level Before 0----------10
After 0----------10

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders

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(Please cross out the response to a question that does not apply)

PRACTICAL GILT SELECTION

1. Too many sows die or have to be culled before they become profitably productive. How many sows on your unit are culled before they reach 4 - 6 litters? 2%, 10%, 20%, 25%, 30%. (Circle the closest figure)

2. What would you look for in the selection of gilts? (Tick the important factors)

PERFORMANCE	TICK	APPEARANCE	TICK
Parents of gilt	( )	Fatness of the carcase	( )
Weight for age	( )	Sound legs	( )
MLC Test index of merit	( )	"Weakness" in confirmation	( )
F. C. R.	( )	Poor stance	( )
Temperament	( )	Six-teats each side	( )
Genetic abnormalities	( )	Properly formed vulva	( )

3. Please assess your ability to select gilts on the rating scales shown below;

KNOWLEDGE level concerning gilt appearance	Before course	0----------5
	After course	0----------5
CONFIDENCE level to select on appearance	Before course	0----------5
	After course	0----------5

4. After how many litters do you normally cull sows? 4, 5, 6, 7, 8. (Circle the answer that is either the unit policy or normally occurs)

5. What is the main reason for culling sows? (tick the main problem/reason on your unit. Assess on a scale of 0-5 your confidence to influence the culling which is within the control of a stockman)

	TICK problem on your unit	Control of Stockman (confidence)
Lameness		0----------5
Mis-mothering		0----------5
No milk/ shortage		0----------5
Old age		0----------5
Paralysis		0----------5
Poor progeny		0----------5
Reproductive failure		0----------5
Udder problem		0----------5
Mange		0----------5
Tail- biting		0----------5

6. List FOUR factors that influence herd replacement policy.

a)_____

b)_____

c)_____

d)_____

7. What is the herd replacement policy for your unit. _____
_____
_____
_____

8. Please rate your ability to recognise the following problems in association with gilt selection. PLEASE USE THE SCALES BELOW

ABILITY to recognise		
Umbelical hernia	Before course	0----------5
	After course	0----------5
Splayleg	Before course	0----------5
	After course	0----------5
Inverted teats	Before course	0----------5
	After course	0----------5
Intersey, hermaphroditism	Before course	0----------5
	After course	0----------5
Intersey	Before course	0----------5
	After course	0----------5

9. How can genetic improvement work on your unit? _____
_____
_____

10. Is the improvement due to new boars (YES/NO), new improved gilts being purchased from hybrid stock producers (YES/NO), improved feed conversion ratios (YES/NO), or better visual selection (YES/NO). Please delete where applicable.

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders

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(Please cross out the response to a question that does not apply)

DISEASE CONTROL & PREVENTION

1. What is the cost of disease to pig producers? (Please TICK if relevant and number in order of importance 1 - 5)

	TICK	Order of Importance
Deaths of pigs/sows/boars		( )
Loss of liveweight gain		( )
Poor food conversion ratio		( )
Lower breeding performance		( )
Increased drug costs		( )

2. Are drugs the answer to your disease problems? Yes/No
If "No" then why not? _____
_____

3. What are the ways in which you could minimise disease risk to less than 10% ? (Tick the problem on your unit that could be improved and score the problem in order of importance for solving)
eg. Vaccination ( ) (2)

	TICK	Order of imp. for solving
Building design	( )	( )
Hygiene/Disinfection	( )	( )
Introduction of new stock	( )	( )
Medication	( )	( )
Use of vet records	( )	( )

5. Please assess your level of awareness of disease being brought into the unit from outside. Score on the scales provided.

AWARENESS of DISEASE
Before the course 0----------5
After the course 0----------5

7. Please assess your level of knowledge on the spread of disease within the unit. Score on the scales provided.

KNOWLEDGE of DISEASE SPREAD
Before the course 0----------5
After the course 0----------5

9. Were you surprised at the weight of dead material on the site for disposal? YES/NO

10. Are you able to calculate the dead material produced by a 100 sow herd, producing finnished pigs? YES/NO

11. "Hygiene is very important". What are the most important stages in cleaning and disinfecting a farrowing house or finishing house? (TICK the appropriate job)

	TICK
Remove demountable equipment	
Soak walls, floors, fixed equipment	
While soaking, roughly pre-clean equipment	
Sanitise drinking system, water bowls, etc	
Power hose walls, floor, etc	
Disinfect pens starting from top to bottom	
Disinfect equipment	
Let dry	
Check electrics, gas, ventilation	
Rest building if possible	

12. Do you keep records and use them for reference? Yes/No

13. What use should we make of records? Assess your level of confidence at using the records to do the following - (score 0 - 5)

	0 5	
Planning/Checking production	*----------*	Before
	----------	After Course
Reproduction data	*----------*	Before
	----------	After Course
Monitoring disease	*----------*	Before
	----------	After Course
Check food conversion ratios	*----------*	Before
	----------	After Course

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders
==========

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(Please cross out the response to a question that does not apply)

REDUCING PIGLET MORTALITY
==========

1. Is piglet starvation a problem on your unit? YES/NO If "YES" then what action do you take to prevent it?
   TICK the list below if you follow any of these procedures.

List A	TICK	List B	TICK
Cross fostering		Batch farrowing	
Colostrum in 6 hours		Supplementary feeding	
Commercial milk powder		Hand rearing	
Check the number of teats		Shift suckling	

2. How do you ensure that the sows have adequate milk supplies ?
   Check the list below and TICK those measures that you use on your unit. Assess your confidence to use these measures on a scale of 0 ---- 5 before and after todays session. Use an "X" on the scale.

	TICK	SCALE of CONFIDENCE
Correct feeding in pregnancy	Before	0----------5
	After	0----------5
Correct management to avoid MMA	Before	0----------5
	After	0----------5
Condition scoring	Before	0----------5
	After	0----------5
Culling policy	Before	0----------5
	After	0----------5

3. How important is fostering on your unit? Very/ Sometimes/ Not used
   Circle the one that is correct.

4. What percentage of piglet deaths are due to starvation? _____%
   What is the answer for your unit? _____%

5. What percentage of piglet deaths are due to crushing? _____%
   What is the answer for your unit? _____%

6. Are you or the manager satisfied with the farrowing crate and pen design? Yes/No If "No" then do you have the following problems

Farrowing Pen Design	TICK
Size of the crate and way sow lies	
Design of the slats	
Position of the creep	
Overall environment - draughts	
- insulation	
- ventilation	
- temperature	
Type of feeder and drinker	

7. Are you responsible for farrowing pen management ? Yes/No If the answer is "Yes" then what do you consider to be the THREE most important areas of farrowing pen management which can minimise losses in the farrowing unit (List in order of priority)_____
a)_____
b)_____
c)_____

8. Please assess your level of knowledge and confidence in the farrowing house using the following rating scales;

KNOWLEDGE Level on Causes of piglet mortality	**Before course**	0----------5
	After course	0----------5
CONFIDENCE Level on improving farrowing conditions	**Before course**	0----------5
	After course	0----------5

9. What action would you take to eliminate the factors which cause an outbreak of E. Coli ? Choose from the list below and indicate any that you use on your unit.

	TICK	**TICK (used on your unit)**
Reduce stress		
Warm, dry housing		
Closed herd		
Vaccinate sows/gilts		
All in/All out policy		
Calm handling		

10. How confident are you at recognising and dealing with an outbreak of E. Coli. Please score your ability on the scales below.

KNOWLEDGE level to recognise symptoms	**Before course**	0----------5
	After course	0----------5
CONFIDENCE level to deal with disease	**Before course**	0----------5
	After course	0----------5

11. Would you please assess your confidence to recognise the problems and ability to deal with them -- before you came on the course and afterwards.(Score 0 - cannot recognise to 5 - easily recognise and 0 to 5 on ability to deal with problem before and after course)

	(0 -- 5)Recognise	(0 -- 5)Ability	
		Before	**After**
Splay legs	( )	( )	( )
Sealed anus	( )	( )	( )
Bleeding navels	( )	( )	( )
Scour	( )	( )	( )
Meninigitis	( )	( )	( )
Joint ill	( )	( )	( )
Anaemia	( )	( )	( )

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG HEALTH & DISEASE TOPICS - Questionnaire for Course attenders (89/90)

You have just attended a two day course on pig health and diseases and a short questionnaire has been prepared to assess the benefits of this training.

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(Please cross out the response to a question that does not apply)

1. Do you have time to spot potential health problems with the pigs? Yes/No _____ (please state if you have sows, weaners rearers, or finishers).

If 'Yes' then what are the most common signs of ill-health in your herd? for example appetite, dung, discharge, or any other reason _____

_____

If 'No' then how do you deal with unhealthy pigs? _____

_____

_____

2. Do you think that you now have more knowledge to spot the unhealthy pig? (Please score your assessment of your knowledge before and after the course using a 'X' on the line between 0 and 5)

```
          0                5
          *----------------*  before the course
          *----------------*  after the course
```

3. Do you take precautions to reduce disease getting into the unit? Yes/No

If 'Yes' then what precautions do you take? _____

_____

_____

If 'No' then why not? (Too costly , too fussy, no legal or contract requirement)_____

_____

4. Do you now understand how disease gets into the pigs themselves? Yes/No

5. What happens to the pig after infections ? (please tick any of the following if you think they are correct)

Does it become immune ?
Does it suffer stress ?
Does it pass on inherited resistance to offspring ?
Do the bugs wait for stress to trigger the disease again ?

6.What level of priority are you able to give or would wish to give the following items; (Need for Action ✓or X Priority - High ✓✓✓ some ✓✓ Low ✓)

Reduction in level of disease
Reduction in the level of stress
Reduction in navel problems
Reduction in the level of wounds
increase in level of hygiene
Increases in disinfection
Increase in use of footbath

Need for Action	Priority

7. One session discussed the spread of disease. Would you please assess your unit for the following items. You can put in brackets on the form any comments eg.I have asked for new needles but Boss won't let me have any!!!

	Poor	Fair	Av.	Good	Excellent
Where does disease come from ? a)How good is floor for reducing spread of disease ?					
b)How clean are the pens?					
c)How good is the power washer?					
d)How good is the vermin control?					
e)How hygienic are your injection needles ?					
f)How good are the facilities for storage of vet materials?					
g)How good is the ventilation in the buildings ?					
h)How good is the temperature control in the unit ?					

	Very Low	Low	Fairly High	High	Very High
i)What is the level of stress for your pigs?					
j)What level of wounds occur (tail-biting, bullying, etc.) ?					
k)What level of navel problems occur ?					
l)What level of immunity do you think the pigs have to most diseases ?					
m)What priority do you have to give to general hygiene ?					

8. Do you perform any of the following operations on the unit ? Yes or No. (after each operation would you please give yourself a score between 1 and 10)
   eg. Do you drench pigs? Yes/~~No~~ (6)

Do you castrate pigs ? Yes/No ( )
Do you inject pigs ? Yes/No ( )
Do you tail dock the pigs? Yes/No ( )
Do you teeth clip the pigs? Yes/No ( )
Do you use ear tattooing ? Yes/No ( )
Do you foot trim the sows? Yes/No ( )

9."Resistance to disease is reduced by stress." What factors increase stress in the list below ? (tick correct factors)

	TICK	LIST IN ORDER
a) crowding	( )	
b) weather	( )	
c) draughts	( )	
d) food	( )	
e) wet bed/ water	( )	
f) group size	( )	
g) transporting	( )	
h) fighting	( )	
i) sudden diet change	( )	
j) mixing groups	( )	

PUT THIS LIST OF FACTORS IN THEIR ORDER OF IMPORTANCE USING ( )

CONDITION SCORING - Questionnaire for Course attenders (89/90)

You have attended a course on condition scoring and a short questionnaire has been prepared to assess the benefits of this training.

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(Please cross out the response to a question that does not apply)

1.Had you ever considered condition scoring the sows? YES/NO
If "YES" did you realise the benefits of condition scoring? YES/NO

2.What do you think of the system ? Very useful Useful Little use Useless for your unit (Cross out the inappropriate response)

3.How confident are you of condition scoring correctly? Please put your own assessment of your ability to condition score on the following scale

```
                    0                   5
                    *-----------------* before the course
                    *-----------------* after the course
```

(if you had no experience before then score 0 and comment no experience)

4."Feeding seems to be the key to condition and sow productivity". Do you feel that you can now feed correctly to achieve the required condition? Please score your feeding skills on the scale provided.

```
                    0                   5
                    *-----------------* before the course
                    *-----------------* after the course
```

5.Please look at the short checklist of items below and assess the usefulness of the condition scoring method to your pig unit on the scale "poor" to "excellent".(place a tick under the required heading)

	Poor	Fair	Av.	Good	Excellent
a.How easy was it to pick up the method?					
b.How good was your condition scoring?					
c.How easy was it to use the condition scoring charts?					
d .What are the chances of using this method at work?					
e.What are the chances of changing feed rations based on condition scoring?					

6. The following are methods of controlling feed consumption. TICK whether you use the method and score your ability to use it (0 - 5).

	TICK	SCORE
By Eye		( )
Weighing		( )
Backfat		( )
Condition scoring		( )

7. After attending this course you may have identified key areas where action is required to introduce the new knowledge and skills that you have acquired. Please tick the following list using the scoring key provided.

SCORING KEY

Need for Action
action needed
no action

Priority/Urgency
1. High Priority/ very urgent
2. Some urgency
3. Little urgency

	Need for Action	Priority/Urgency
Benefits of condition scoring		
a. The need to introduce condition scoring		
b. Controlling food usage when related to sow scores		
c. Better control of culling rate		
d. To increase sow productivity		
Pigs born per litter		
Piglet survival		
Sow milk yield		
Regular breeding		
e. Method of feeding to give a target score/weight.		
f. Improved environmental control		
g. Regular adjustment to feed without delay		
h. Regular checking of leg & body injuries		
i. Aim for sow scores of 3.5 + 0.5		

8. What are the target condition scores for sows at certain stages of gestation?

	SCORE
Day of weaning	( )
Mid-pregnancy	( )
Pre-farrowing	( )

9. Can you condition score your sows now? YES/NO

10. How many of your scores were correct compared with the instructor?
___ out of ___ . eg. 8 out of 10.

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders
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(Please cross out the response to a question that does not apply)

AIMING AT MAXIMUM CONCEPTION
==========

1. How many days should it take from weaning to get the sow back in pig?
Answer _____ days

2. What do you understand by "DAYS WASTED" ? _____
_____

3. What is that loss worth in terms of productivity? Loss of ___/litter

4. What is the current value of a weaner ? £_____ per 25Kg Weaner

5. How confident are you at calculating the number of productive days?

CONFIDENCE	before course	0----------5
	after course	0----------5

6. The most usual reasons for long weaning to service time are:
Failure to come in oestrus promptly and
Failure to detect heats
Indicate on the scale your confidence Before the course to detect heat in sows. 0----------10
After the course 0----------10

7. Would you please score your level of knowledge concerning maximising conception , to increase the level of successful services leading to high conception rates. (Please score on the scales given with an "x" to show your level of knowledge before and after the course)

		No Knowledge ... Very Knowledgable
eg Assess boar fertility	Before	0----------10
	After	*----------*
The causes of high "WASTED DAYS"	Before	0----------10
	After	*----------*
The calculation of "WASTED DAYS"	Before	0----------10
	After	*----------*
The cost of loss of production due to "WASTED DAYS"	Before	0----------10
	After	*----------*
The detail of the reproductive process	Before	0----------10
	After	*----------*
The factors affecting boar fertility	Before	0----------10
	After	*----------*
The ideal time for copulation	Before	0----------10
	After	*----------*
The need for so many sperms	Before	0----------10
	After	*----------*
The working of the oestrus cycle	Before	0----------10
	After	*----------*
The need for good observation & management	Before	0----------10
	After	*----------*

8. There are many factors that affect the success of a mating. TICK the items on the list below that have an influence upon sperm numbers, viability and motility.

	TICK
Effect of temperature	
Over use of boar	
Under use of boar	
Reduced fertility	
Congenital abnormality	
Age of boar	

9. "A GOOD STOCKMAN CAN TELL WHEN A MATING SHOULD TAKE PLACE". What would the person see? TICK the following replies if they are correct and TICK again if they are signs that you used before the course.

	TICK	TICK (used before course)
Ear movement		
Noises of welcome		
Salivation		
Urination		
Dunging		
Sniffing		
Standing		
Back arching		

10. Do you now feel that you have increased your level of knowledge and skills in the area of improving conception rates? YES/NO
If "YES" then please rate your overall improvement on the scales below.

KNOWLEDGE level	Before	0----------10
	After	0----------10
SKILLS level	Before	0----------10
	After	0----------10

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders

During the Winter 1989/90 you attended one or more courses on pig topics and a questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

PRACTICAL GILT SELECTION

1. Too many sows die or have to be culled before they become profitably productive. How many sows on your unit are culled before they reach 4 - 6 litters? 2%, 10%, 20%, 25%, 30%. (Circle the closest figure)

2. What would you look for in the selection of gilts? (Tick the important factors)

PERFORMANCE	TICK	APPEARANCE	TICK
Parents of gilt	( )	Fatness of the carcase	( )
Weight for age	( )	Sound legs	( )
MLC Test index of merit	( )	"Weakness" in confirmation	( )
F. C. R.	( )	Poor stance	( )
Temperament	( )	Six-teats each side	( )
Genetic abnormalities	( )	Properly formed vulva	( )

3. Please assess your ability to select gilts on the rating scales shown below;

KNOWLEDGE level concerning gilt appearance	Before course	0----------5
	After course	0----------5
CONFIDENCE level to select on appearance	Before course	0----------5
	After course	0----------5

4. After how many litters do you normally cull sows? 4, 5, 6, 7, 8. (Circle the answer that is either the unit policy or normally occurs)

5. What is the main reason for culling sows? (tick the main problem/reason on your unit. Assess on a scale of 0-5 your confidence to influence the culling which is within the control of a stockman)

	TICK problem on your unit	Control of Stockman (confidence)
Lameness		0----------5
Mis-mothering		0----------5
No milk/ shortage		0----------5
Old age		0----------5
Paralysis		0----------5
Poor progeny		0----------5
Reproductive failure		0----------5
Udder problem		0----------5
Mange		0----------5
Tail- biting		0----------5

6. List FOUR factors that influence herd replacement policy.

a)_____
b)_____
c)_____
d)_____

7. What is the herd replacement policy for your unit. _____
_____
_____
_____

8. Please rate your ability to recognise the following problems in association with gilt selection. **PLEASE USE THE SCALES BELOW**

ABILITY to recognise

Umbelical hernia	Before course	0----------5
	After course	0----------5
Splayleg	Before course	0----------5
	After course	0----------5
Inverted teats	Before course	0----------5
	After course	0----------5
Intersey, hermaphroditism	Before course	0----------5
	After course	0----------5
Intersey	Before course	0----------5
	After course	0----------5

9. How can genetic improvement work on your unit? _____
_____
_____

10. Is the improvement due to new boars (YES/NO), new improved gilts being purchased from hybrid stock producers (YES/NO), improved feed conversion ratios (YES/NO), or better visual selection (YES/NO). Please delete where applicable.

THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

PIG ENTERPRISE TRAINING - Questionnaire for Course attenders
==========

During the Winter 1988/89 you attended one or more courses on pig topics and a questionnaire has been prepared to assess the benefits of this training.

This form is **TOTALLY CONFIDENTIAL** and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

REDUCING PIGLET MORTALITY
==========

1. Is piglet starvation a problem on your unit? YES/NO If "YES" then what action do you take to prevent it?
   TICK the list below if you follow any of these procedures.

List A	TICK	List B	TICK
Cross fostering		Batch farrowing	
Colostrum in 6 hours		Supplementary feeding	
Commercial milk powder		Hand rearing	
Check the number of teats		Shift suckling	

2. How do you ensure that the sows have adequate milk supplies ?
   Check the list below and TICK those measures that you use on your unit. Assess your confidence to use these measures on a scale of 0 ---- 5 before and after todays session. Use an "X" on the scale.

	TICK	SCALE of CONFIDENCE	
Correct feeding in pregnancy		Before	0----------5
		After	0----------5
Correct management to avoid MMA		Before	0----------5
		After	0----------5
Condition scoring		Before	0----------5
		After	0----------5
Culling policy		Before	0----------5
		After	0----------5

3. How important is fostering on your unit? Very/ Sometimes/ Not used
   Circle the one that is correct.

4. What percentage of piglet deaths are due to starvation? _____%
   What is the answer for your unit? _____%

5. What percentage of piglet deaths are due to crushing? _____%
   What is the answer for your unit? _____%

6. Are you or the manager satisfied with the farrowing crate and pen design? Yes/No If "No" then do you have the following problems

Farrowing Pen Design	TICK
Size of the crate and way sow lies	
Design of the slats	
Position of the creep	
Overall environment - draughts	
- insulation	
- ventilation	
- temperature	
Type of feeder and drinker	

7. Are you responsible for farrowing pen management ? Yes/No If the answer is "Yes" then what do you consider to be the THREE most important areas of farrowing pen management which can minimise losses in the farrowing unit (List in order of priority)_____
a)_____
b)_____
c)_____

8. Please assess your level of knowledge and confidence in the farrowing house using the following rating scales;

KNOWLEDGE Level on Causes of piglet mortality	Before course	0----------5
	After course	0----------5
CONFIDENCE Level on improving farrowing conditions	Before course	0----------5
	After course	0----------5

9. What action would you take to eliminate the factors which cause an outbreak of E. Coli ? Choose from the list below and indicate any that you use on your unit.

	TICK	TICK (used on your unit)
Reduce stress		
Warm, dry housing		
Closed herd		
Vaccinate sows/gilts		
All in/All out policy		
Calm handling		

10. How confident are you at recognising and dealing with an outbreak of E. Coli. Please score your ability on the scales below.

KNOWLEDGE level to recognise symptoms	Before course	0----------5
	After course	0----------5
CONFIDENCE level to deal with disease	Before course	0----------5
	After course	0----------5

11. Would you please assess your confidence to recognise the problems and ability to deal with them -- before you came on the course and afterwards.(Score 0 - cannot recognise to 5 - easily recognise and 0 to 5 on ability to deal with problem before and after course)

	(0 -- 5)Recognise	(0 -- 5)Ability	
		Before	After
Splay legs	( )	( )	( )
Sealed anus	( )	( )	( )
Bleeding navels	( )	( )	( )
Scour	( )	( )	( )
Meninigitis	( )	( )	( )
Joint ill	( )	( )	( )
Anaemia	( )	( )	( )

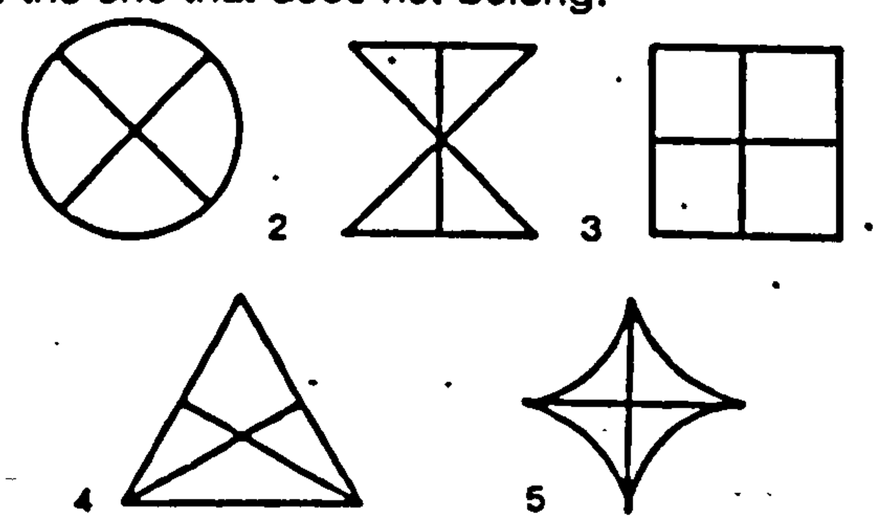
THANK YOU FOR AGREEING TO COMPLETE THIS QUESTIONNAIRE

APPENDIX G

Instructions
You have thirty minutes to solve the problems. The score is equal to the number of correct answers you get within the time limit without looking up the answers. Do not spend too long on any one problem. Go back if you have time at the end.

1

Find the one that does not belong.



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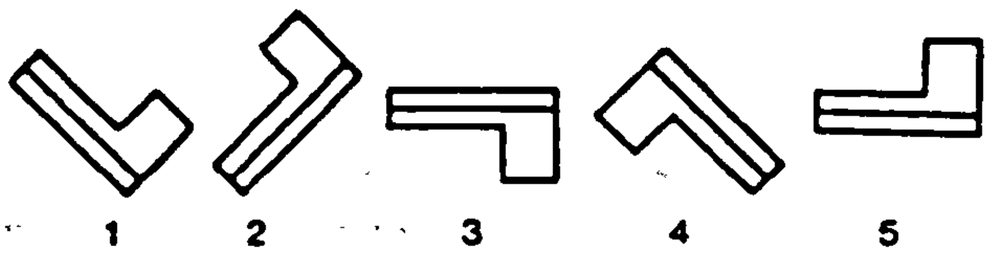

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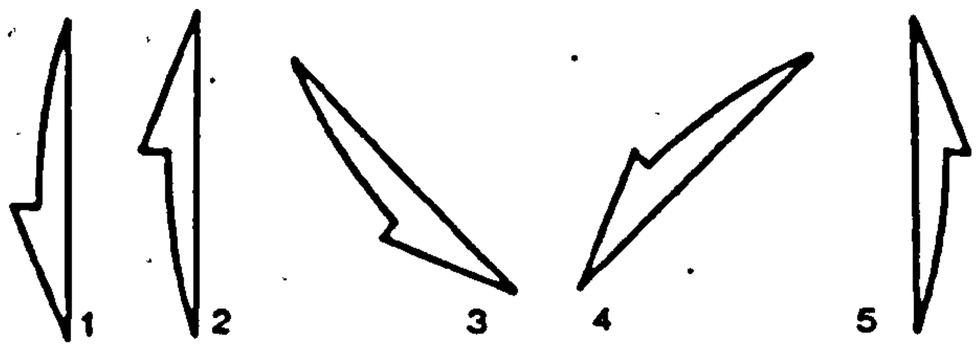

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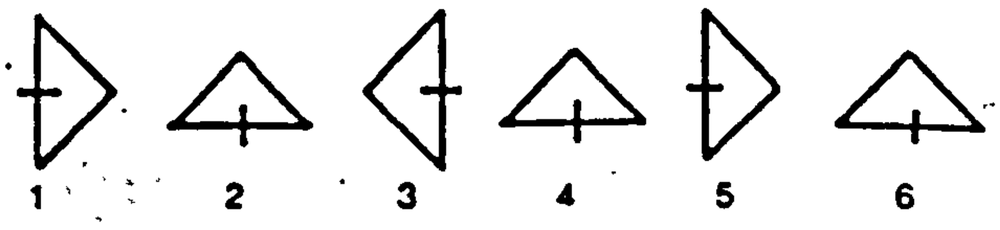

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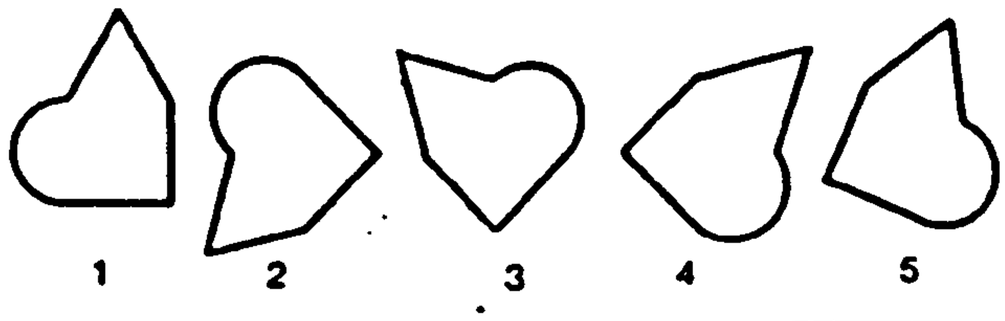

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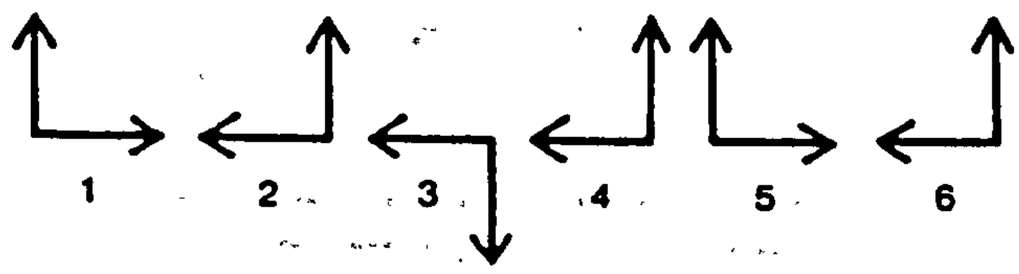
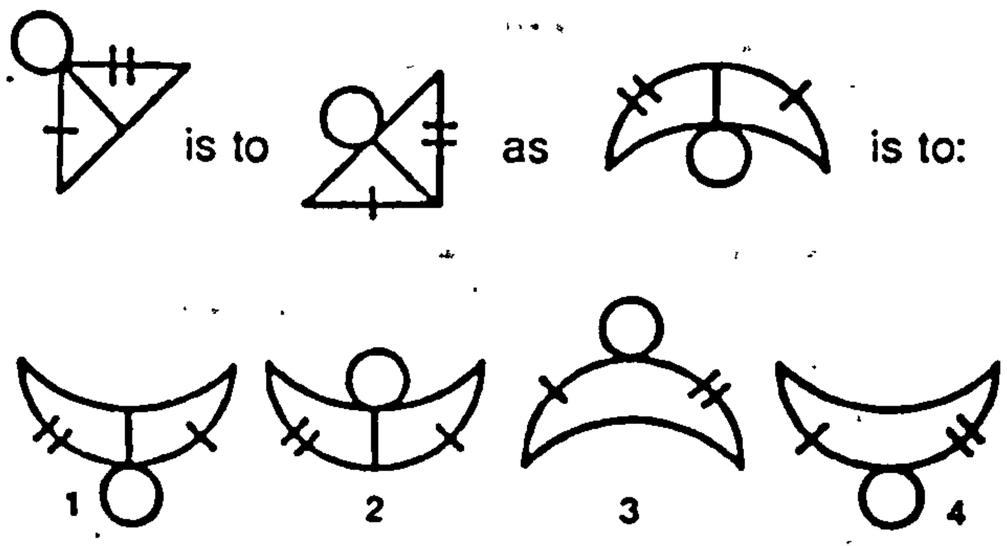


7

Which figure completes the pair?



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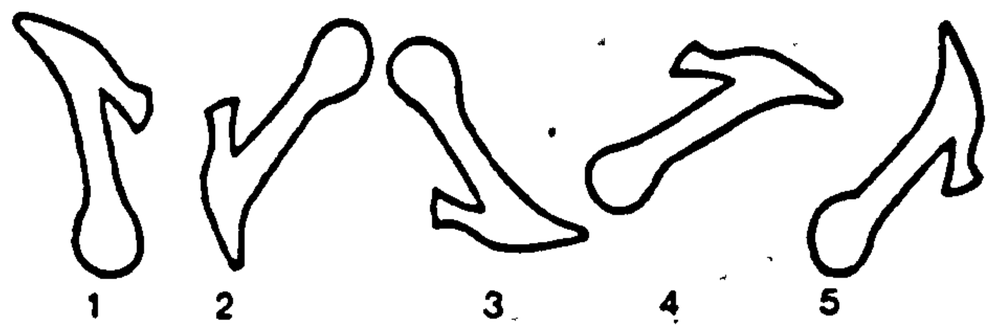

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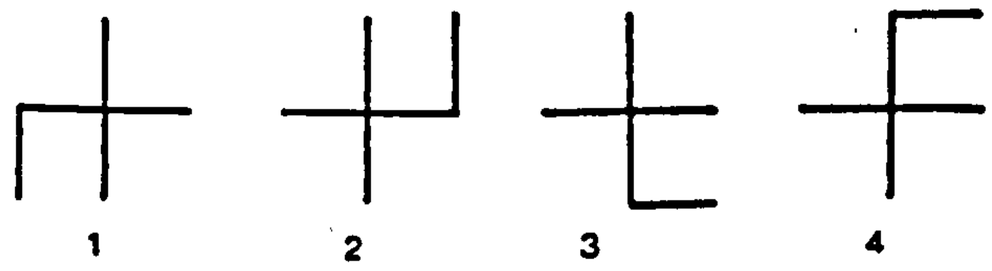

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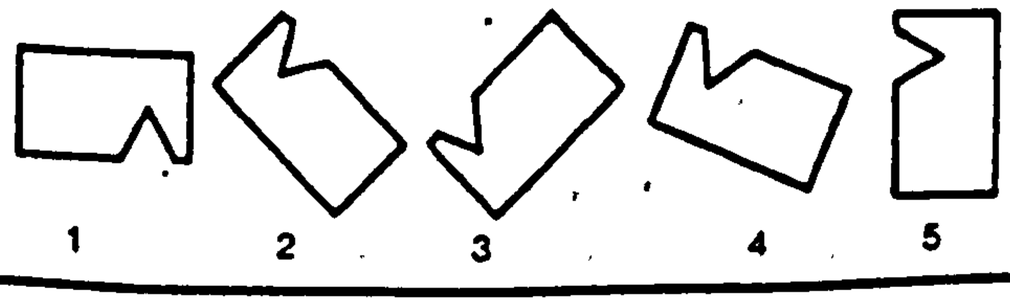

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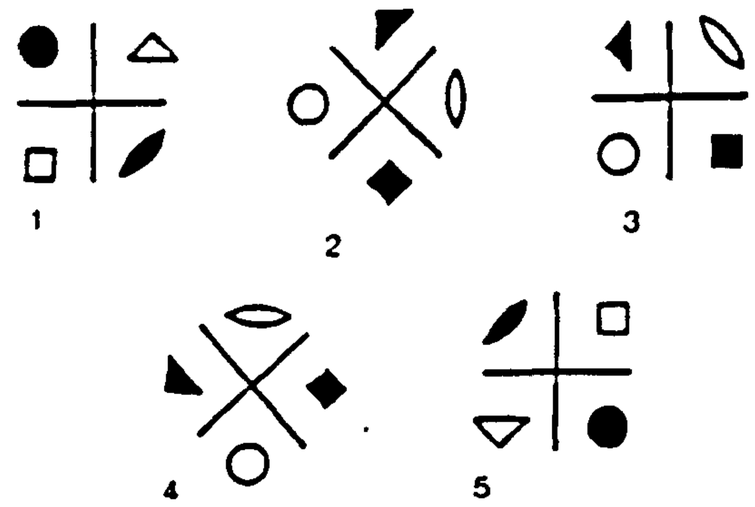

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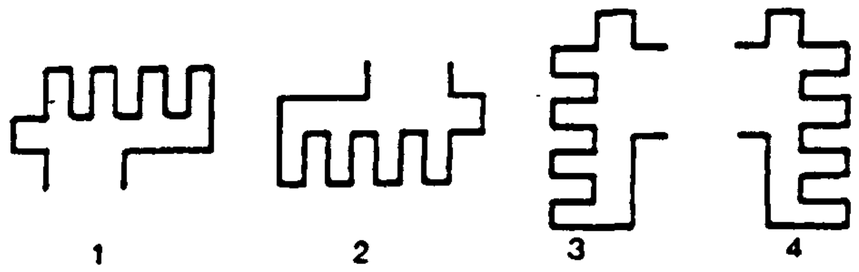

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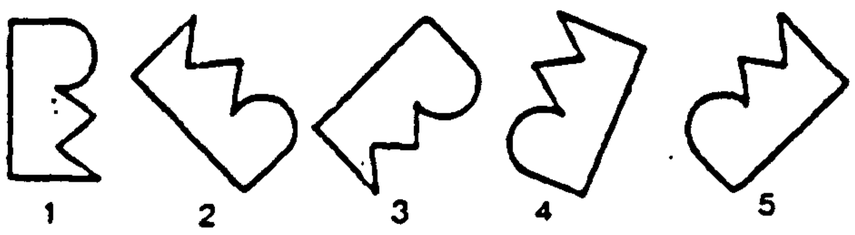

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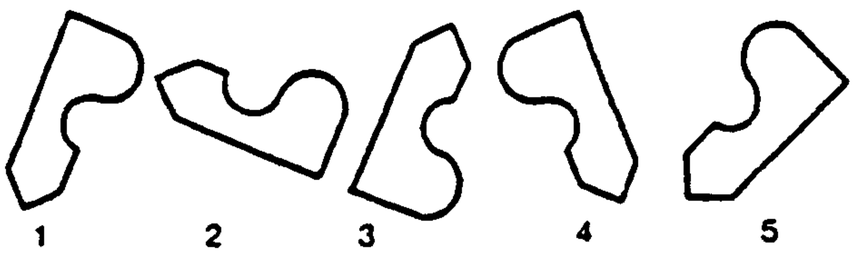

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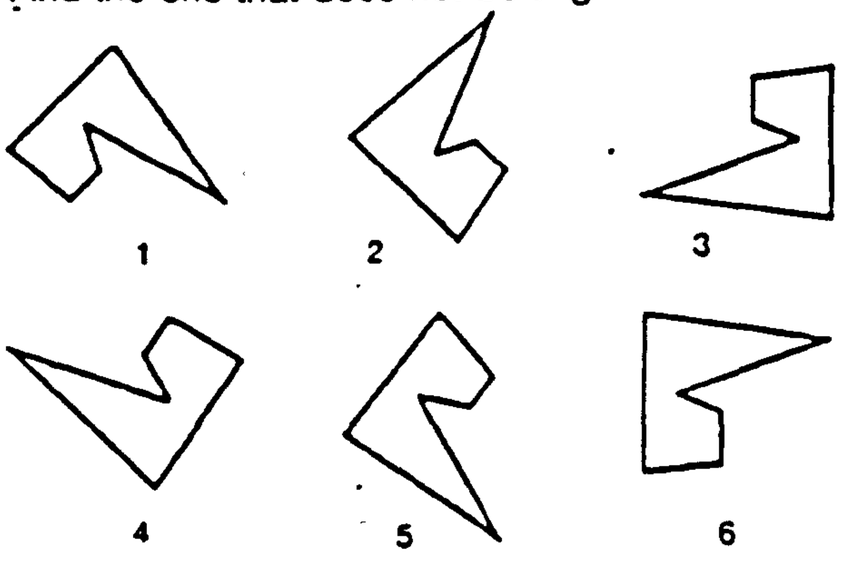

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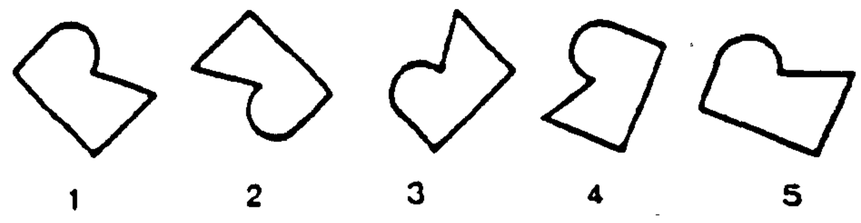

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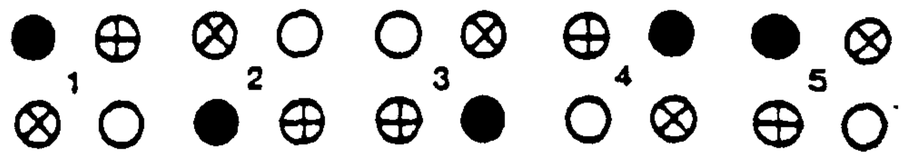

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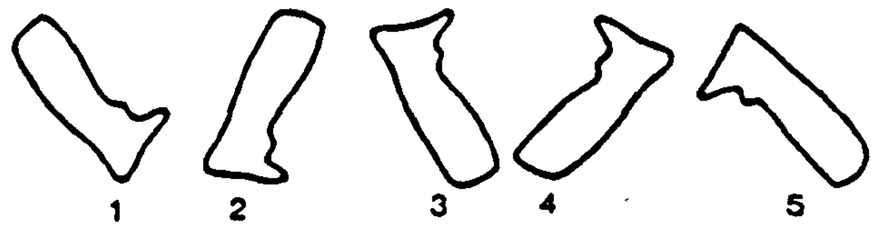

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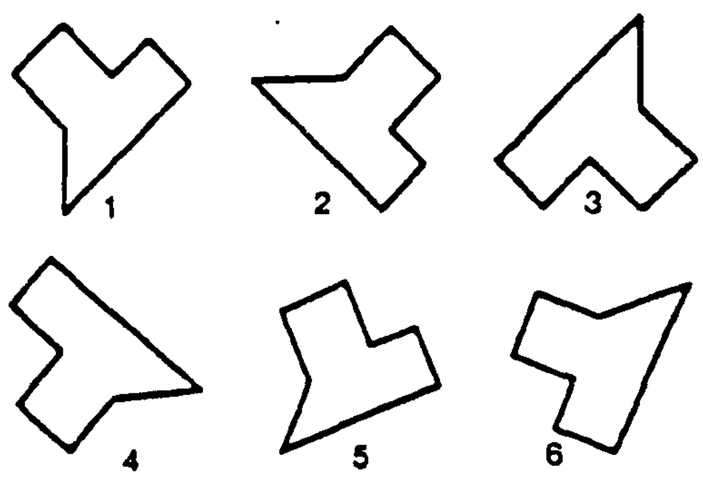

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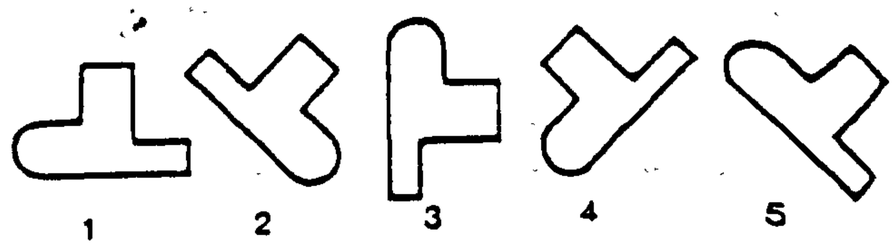

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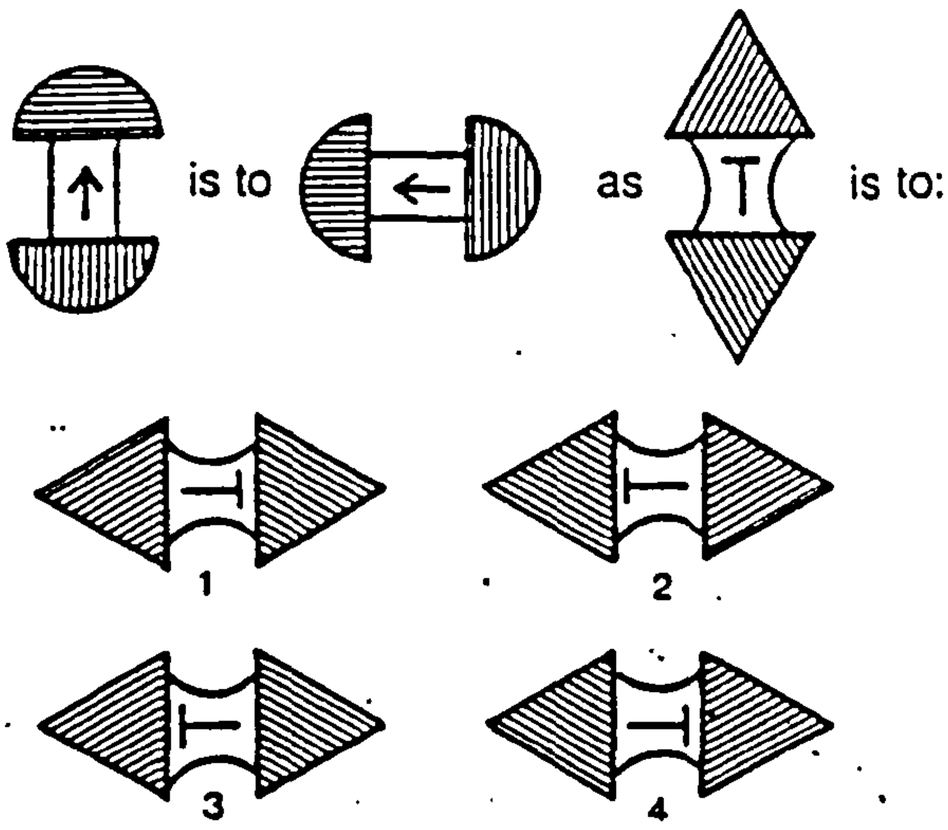

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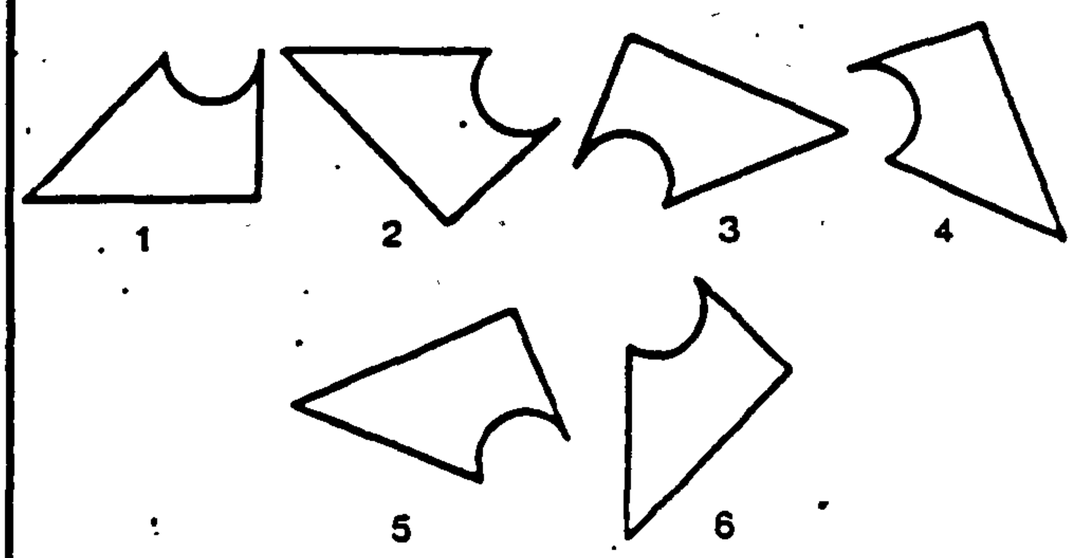

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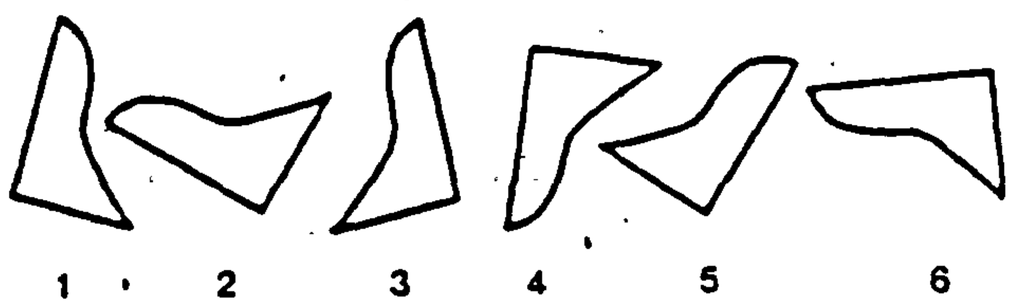

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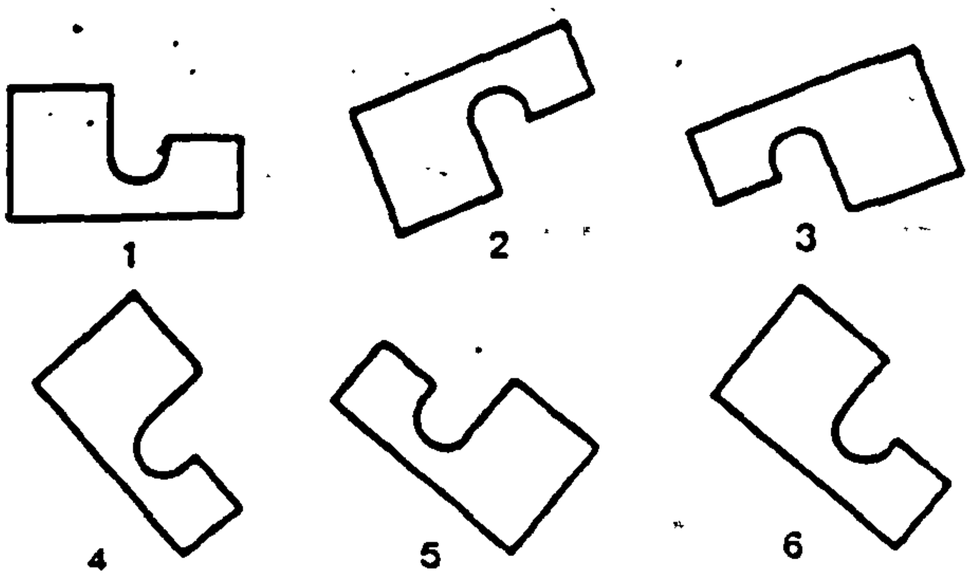

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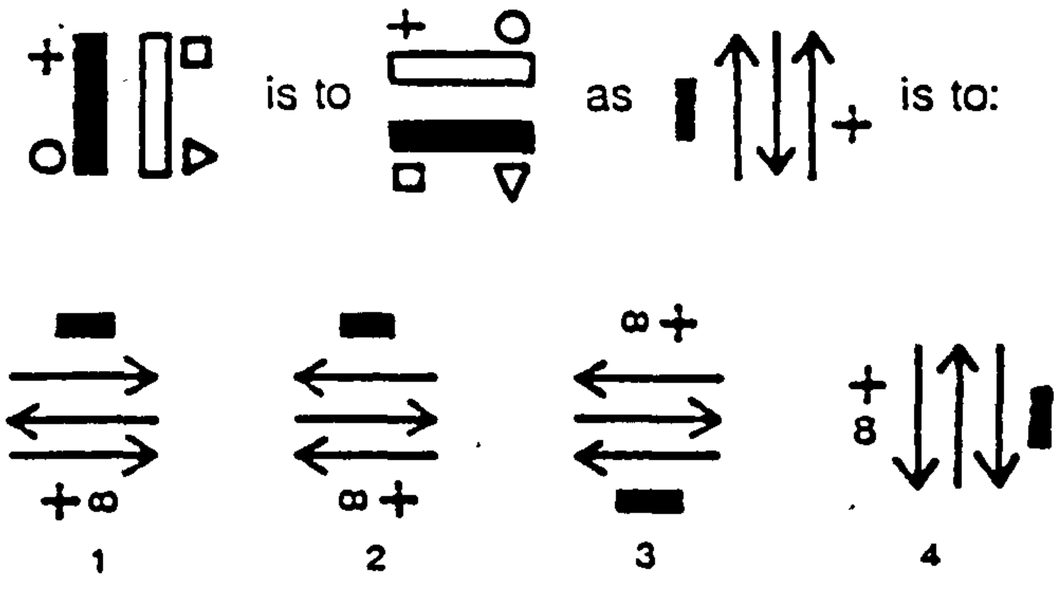

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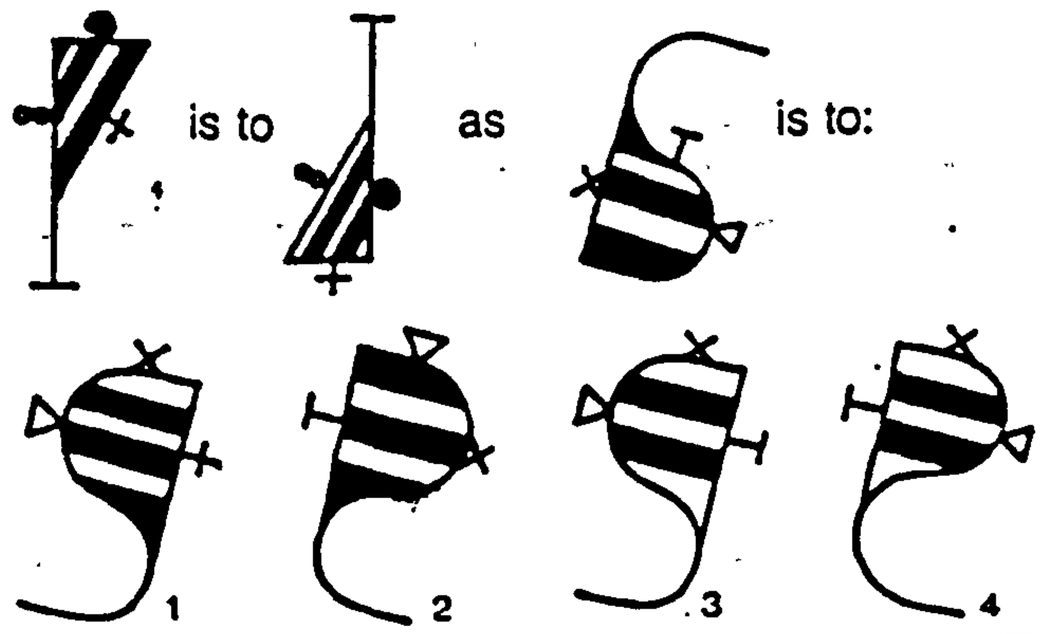

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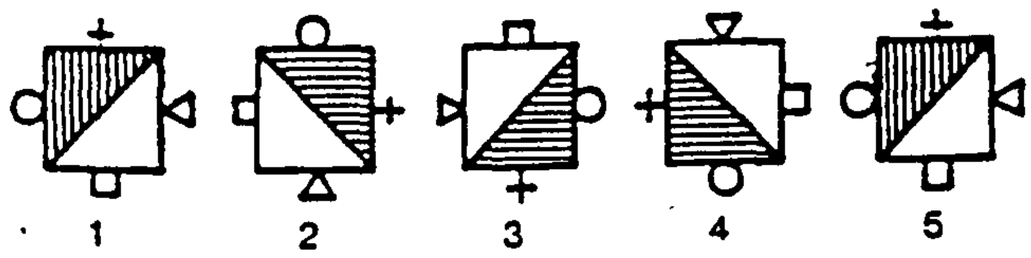

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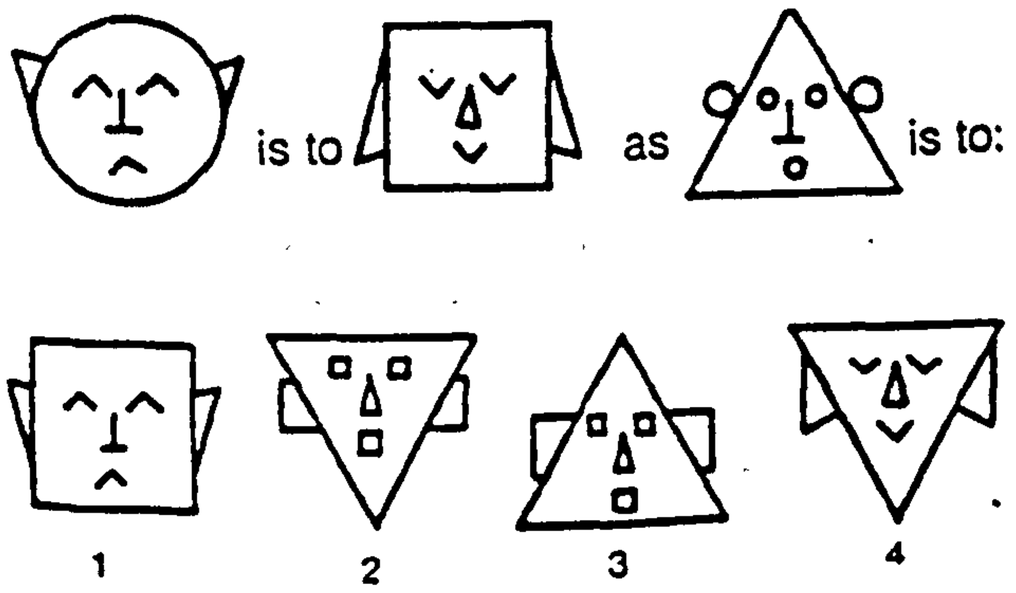

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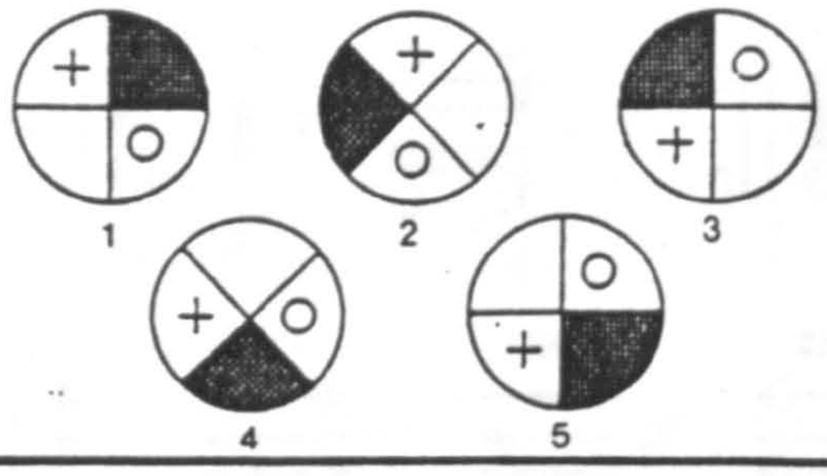

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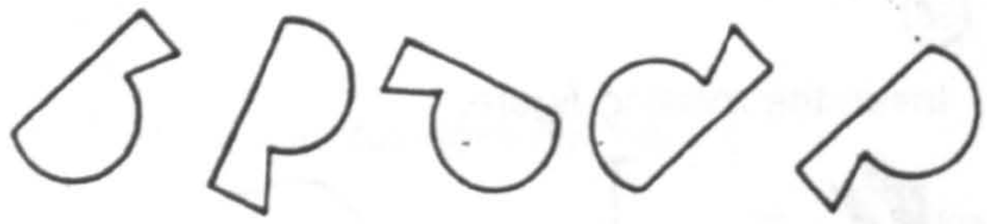

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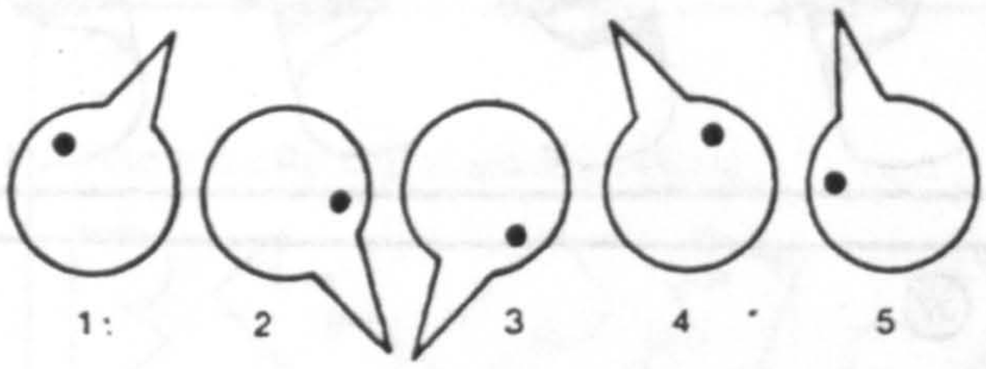

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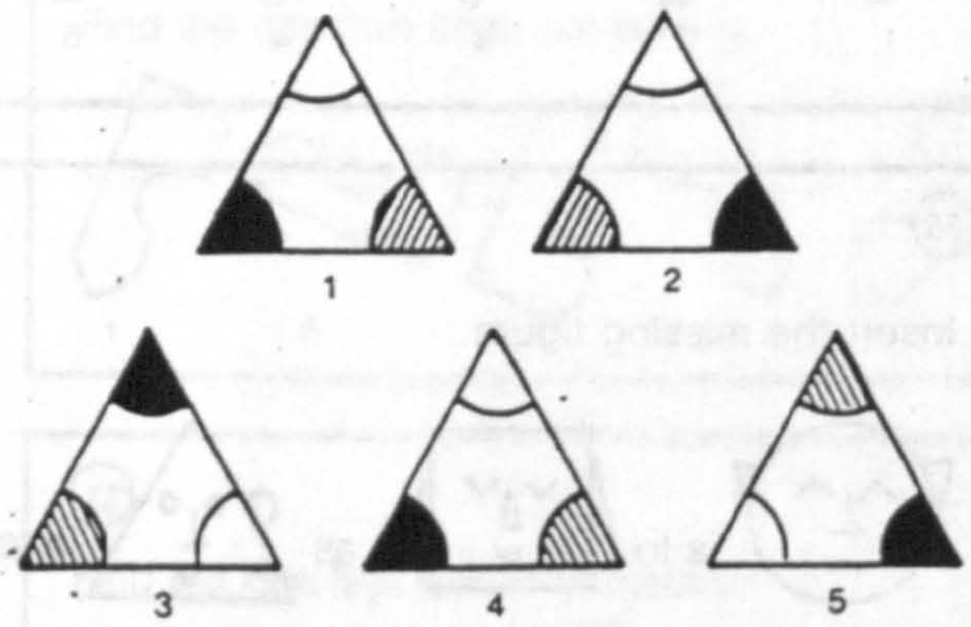

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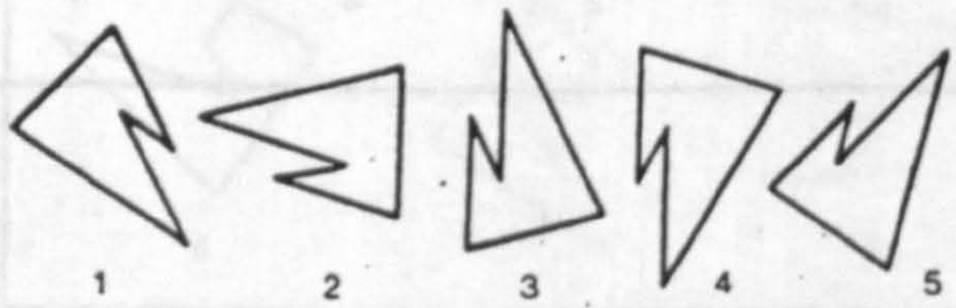

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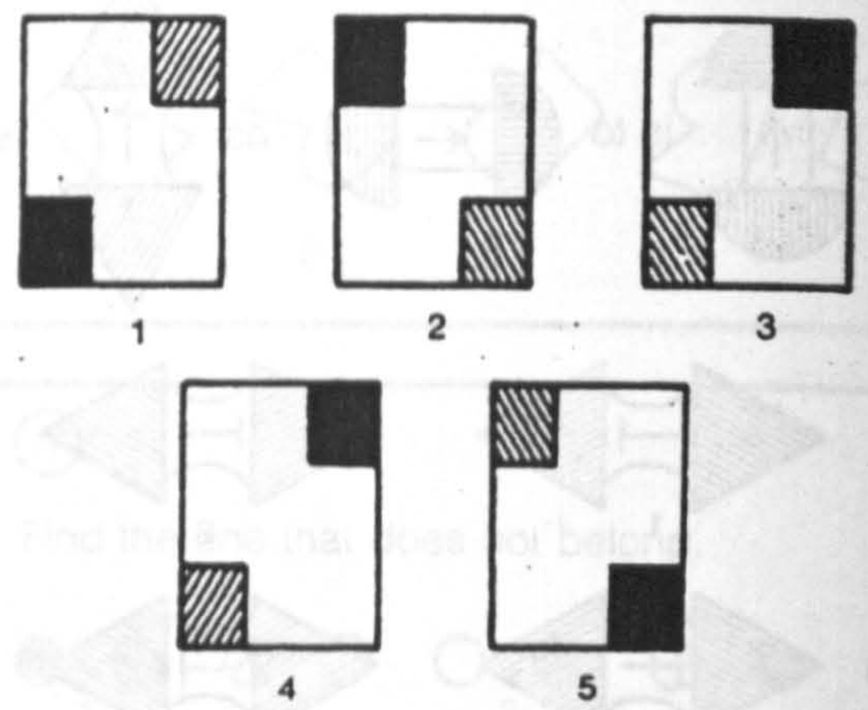

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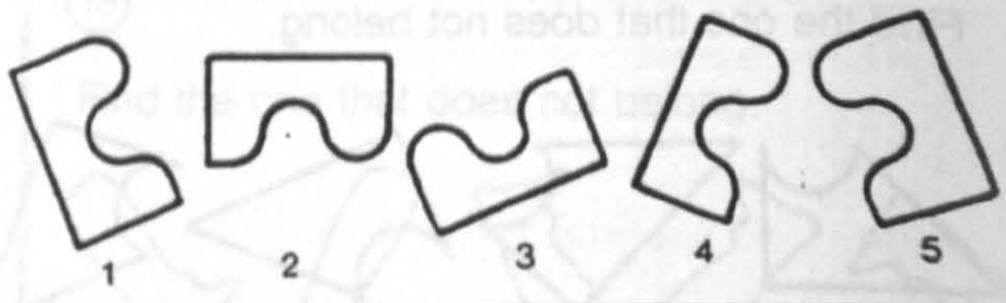

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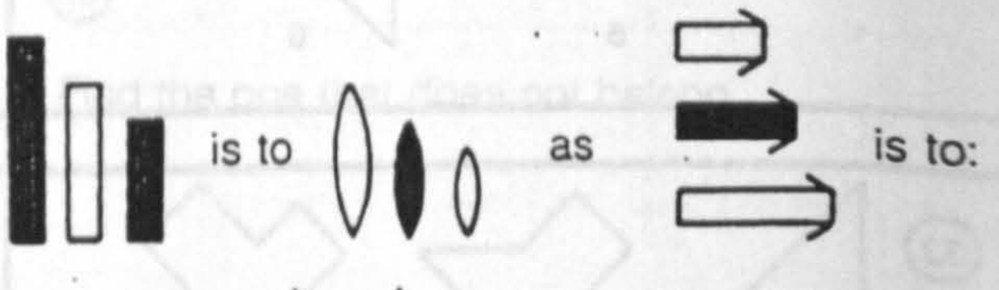

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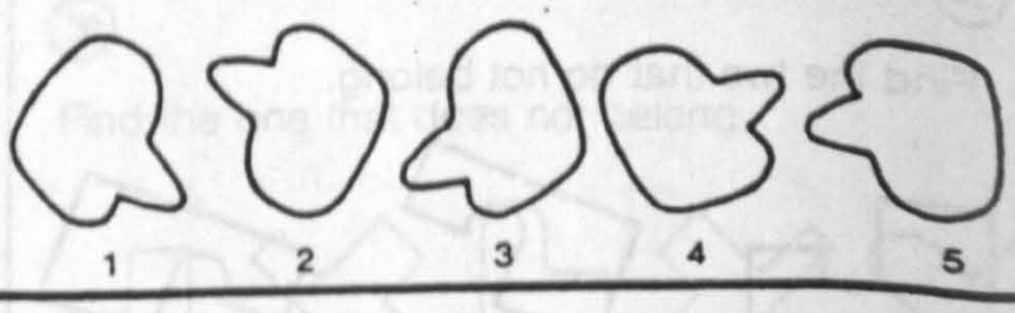

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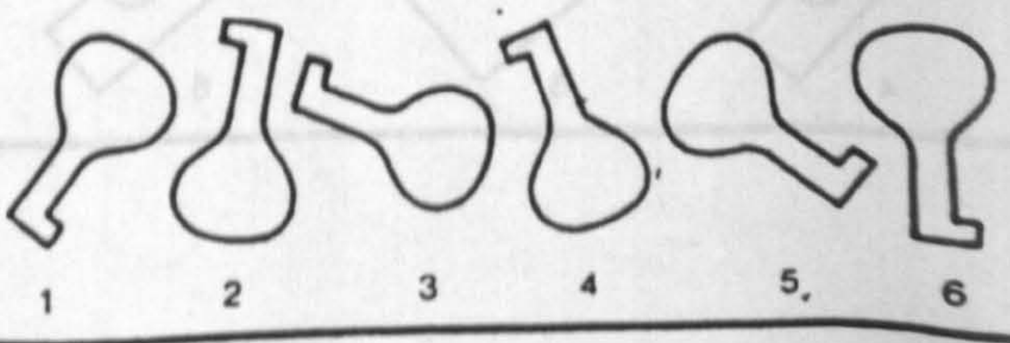

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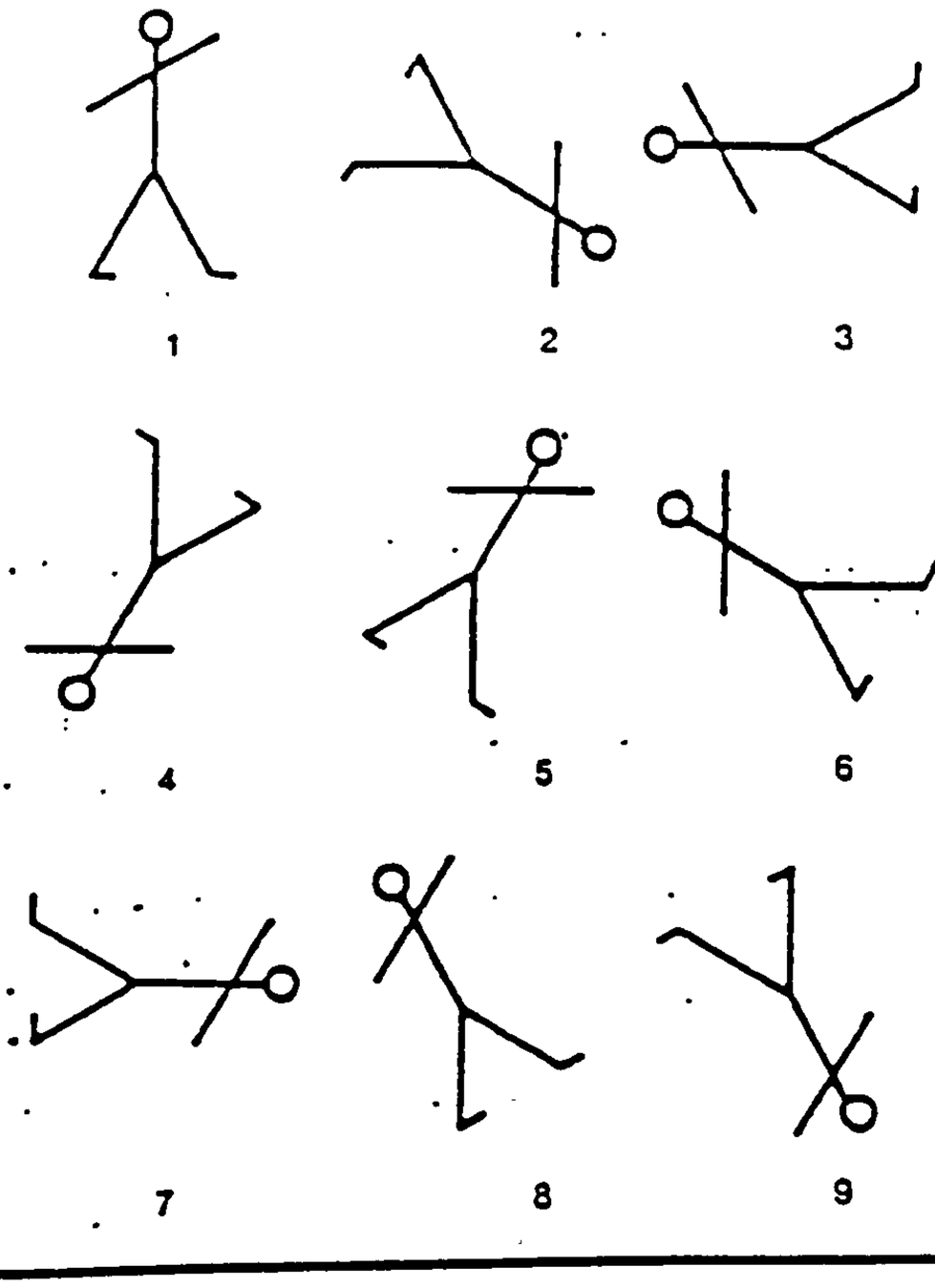

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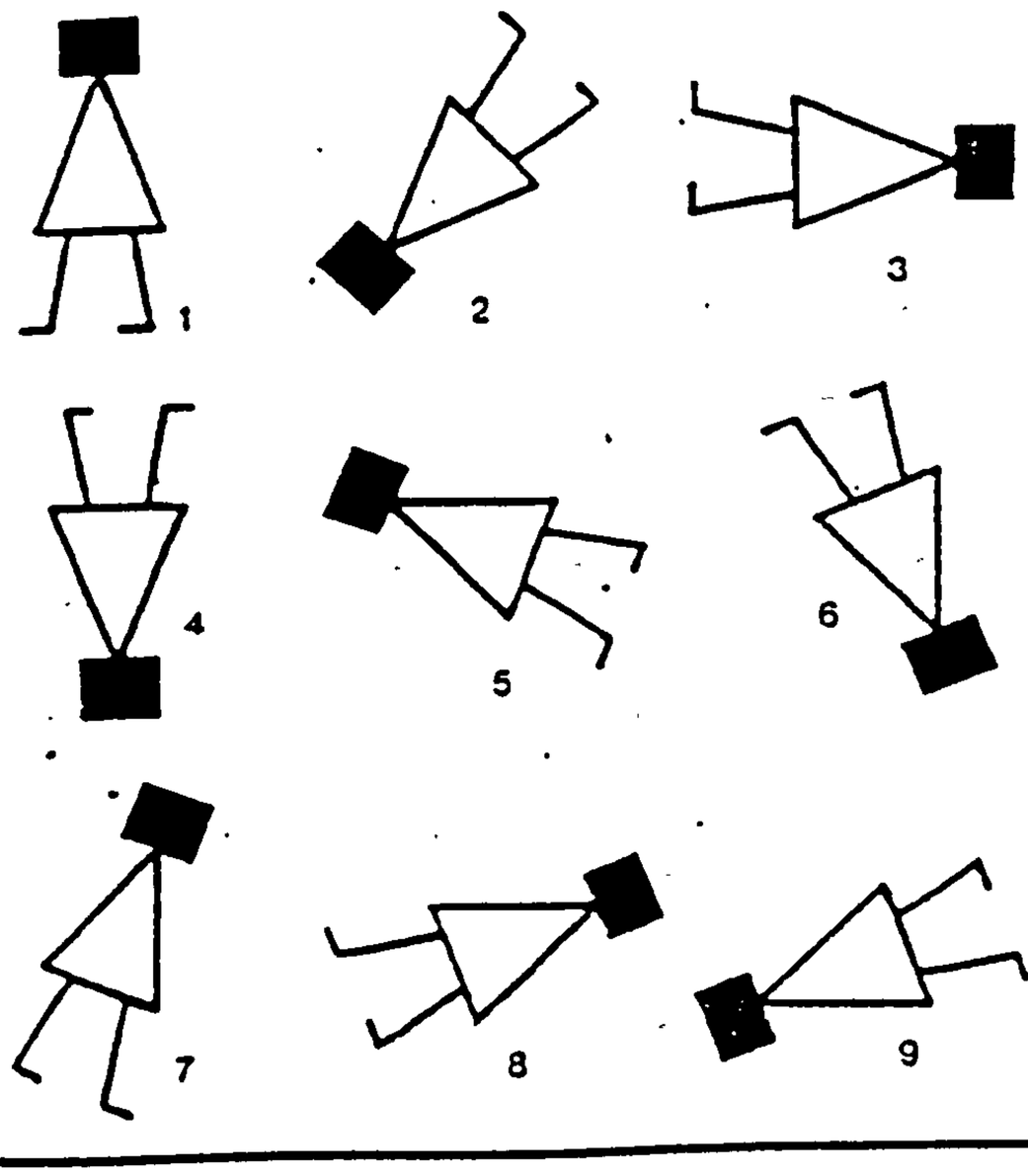
Find the three that do not belong.



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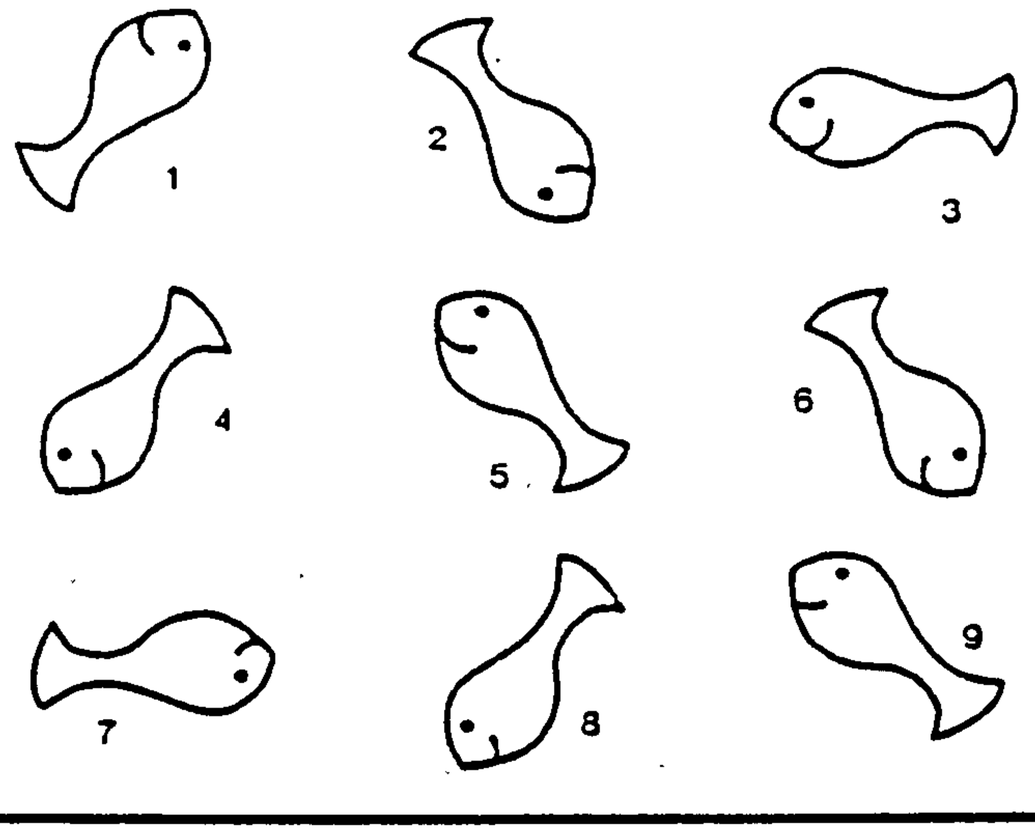

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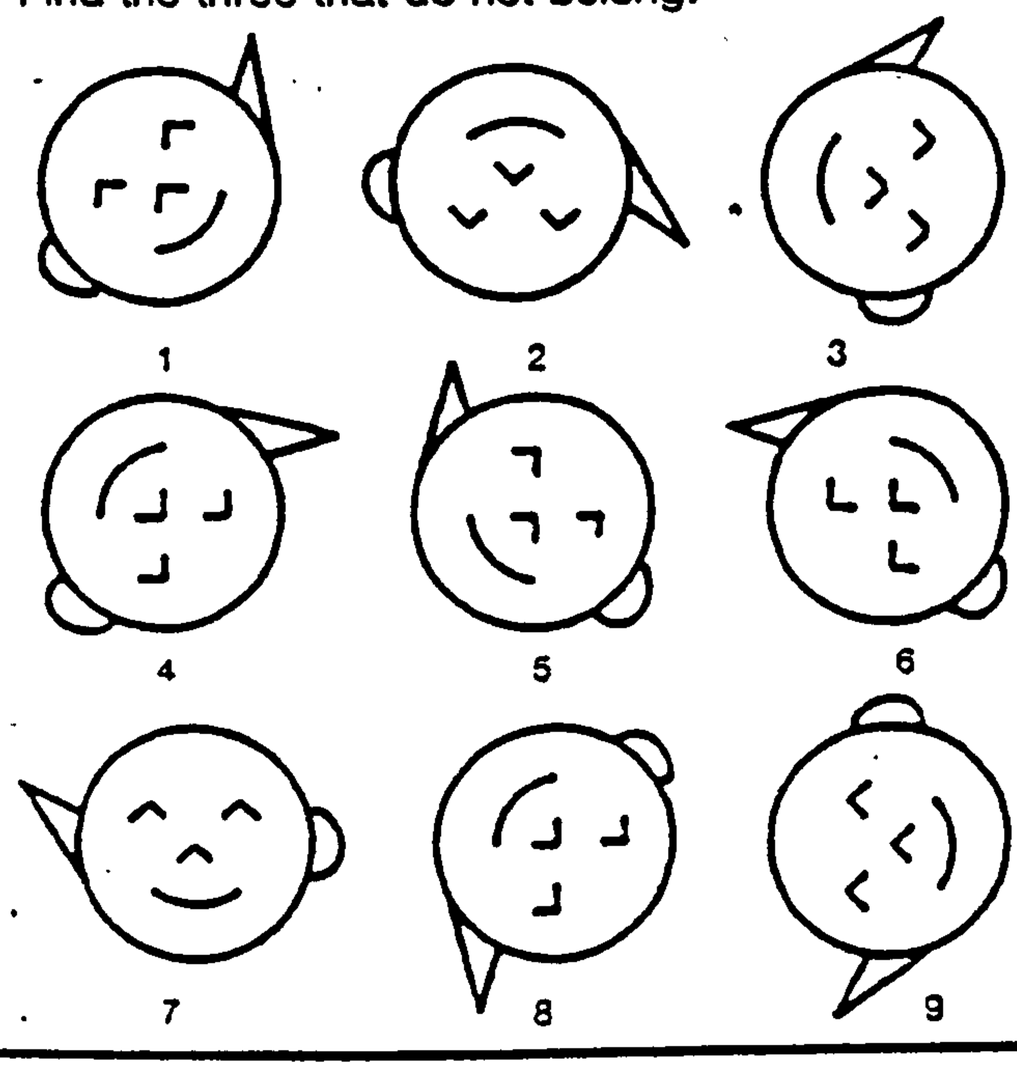

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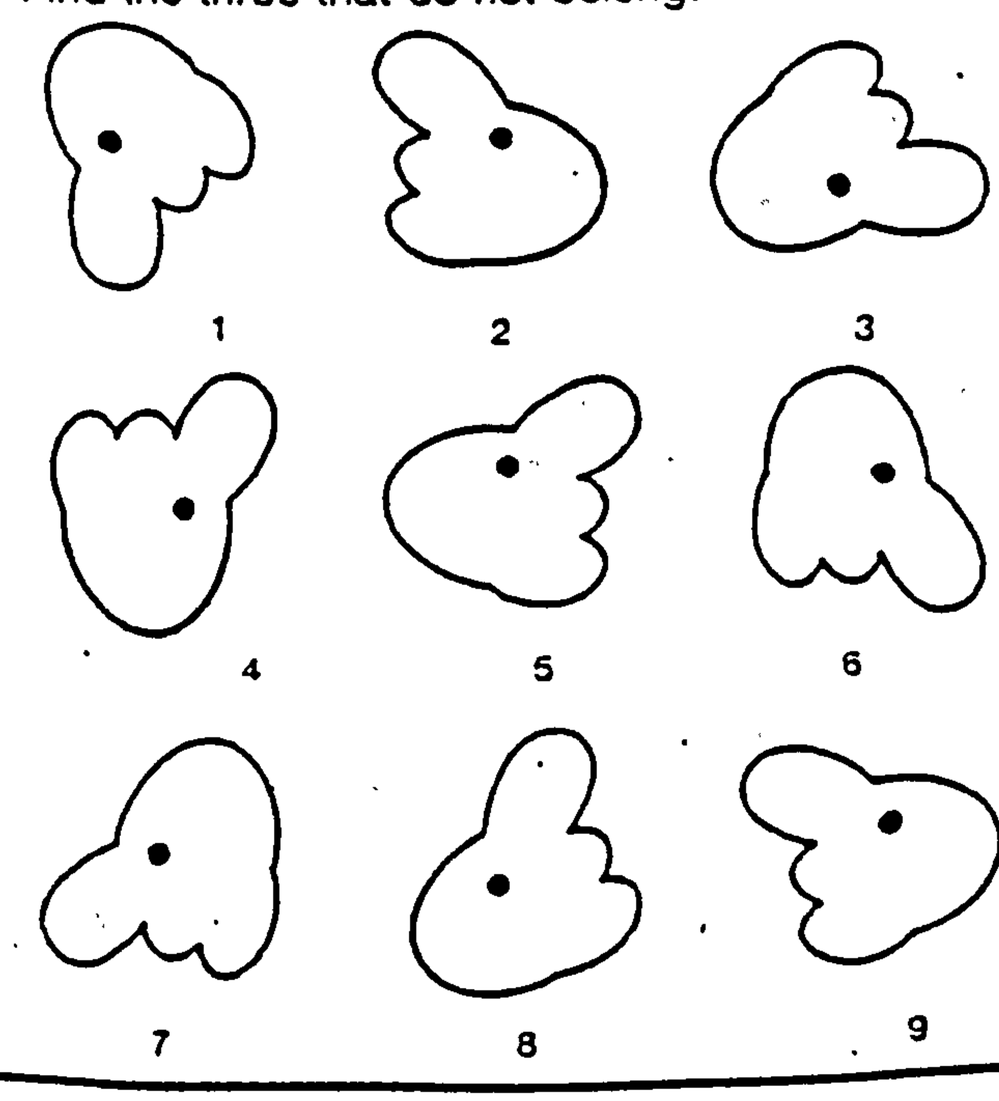

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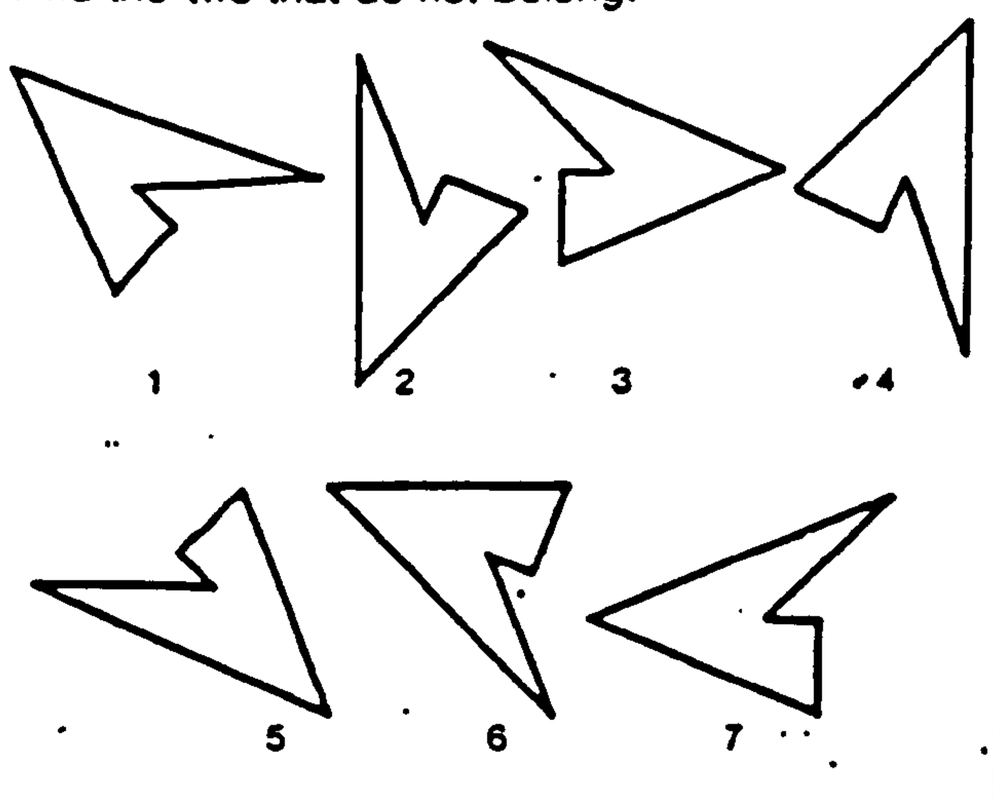

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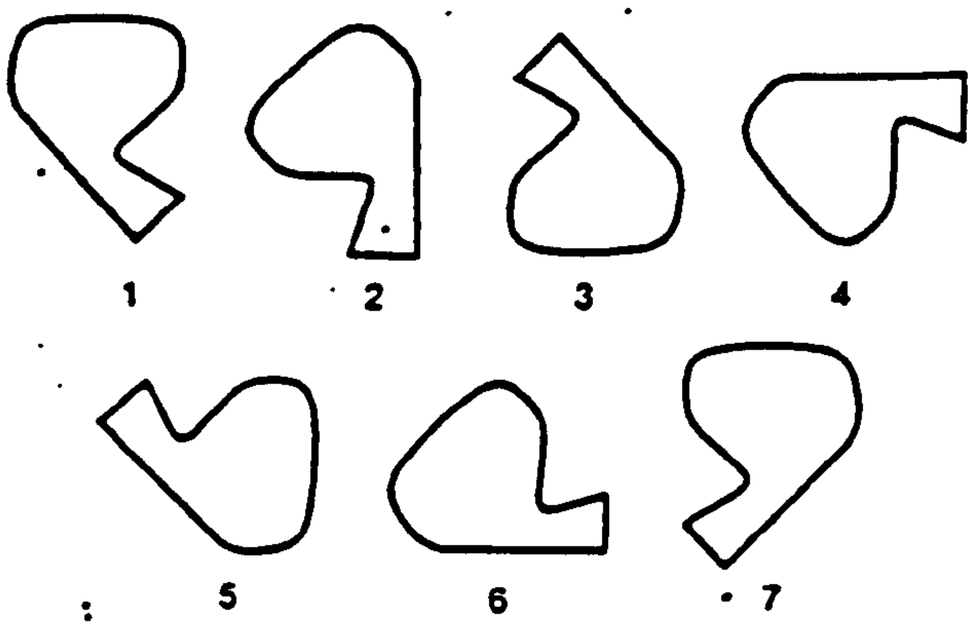

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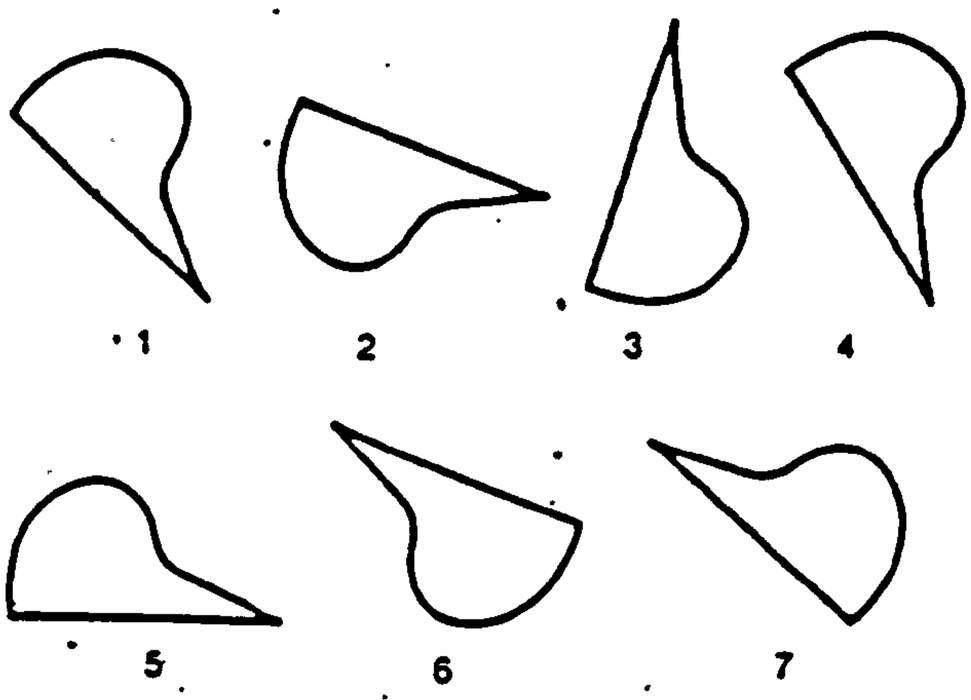

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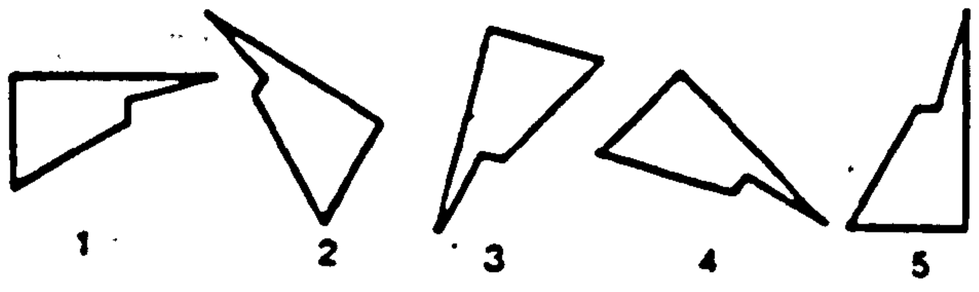

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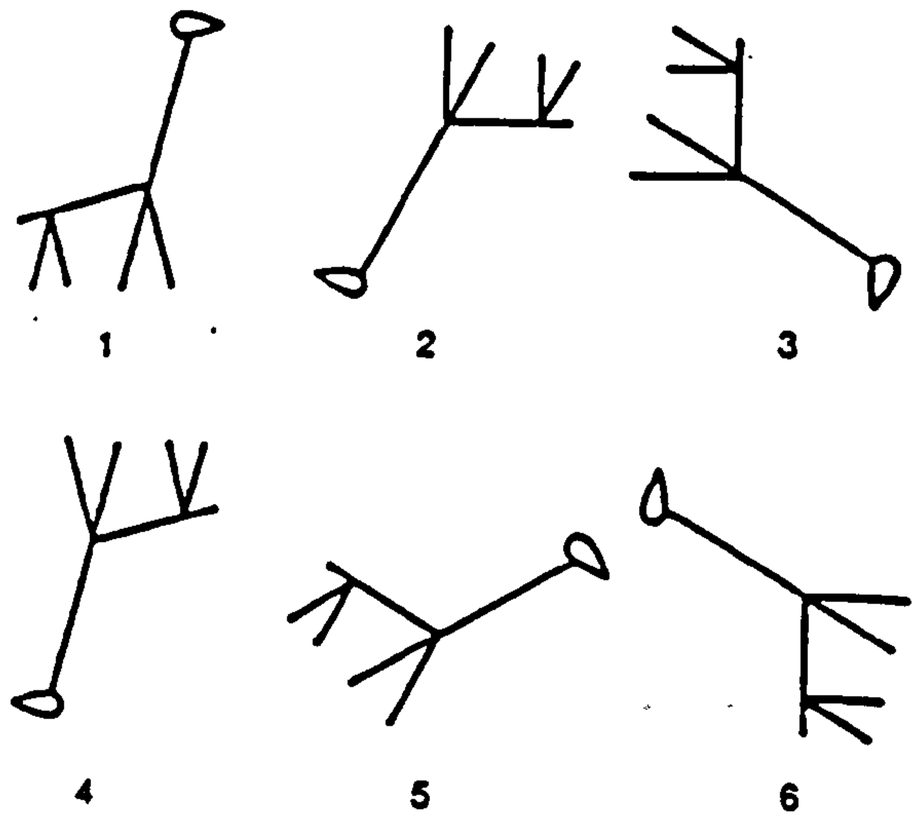

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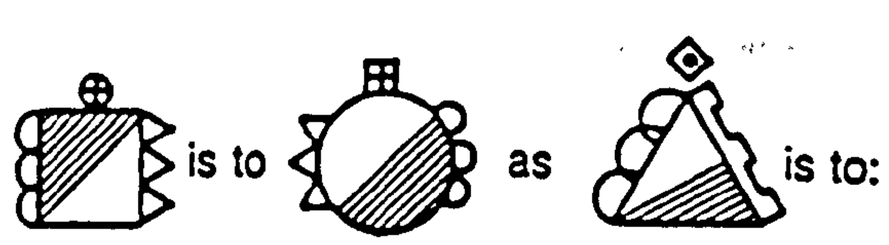

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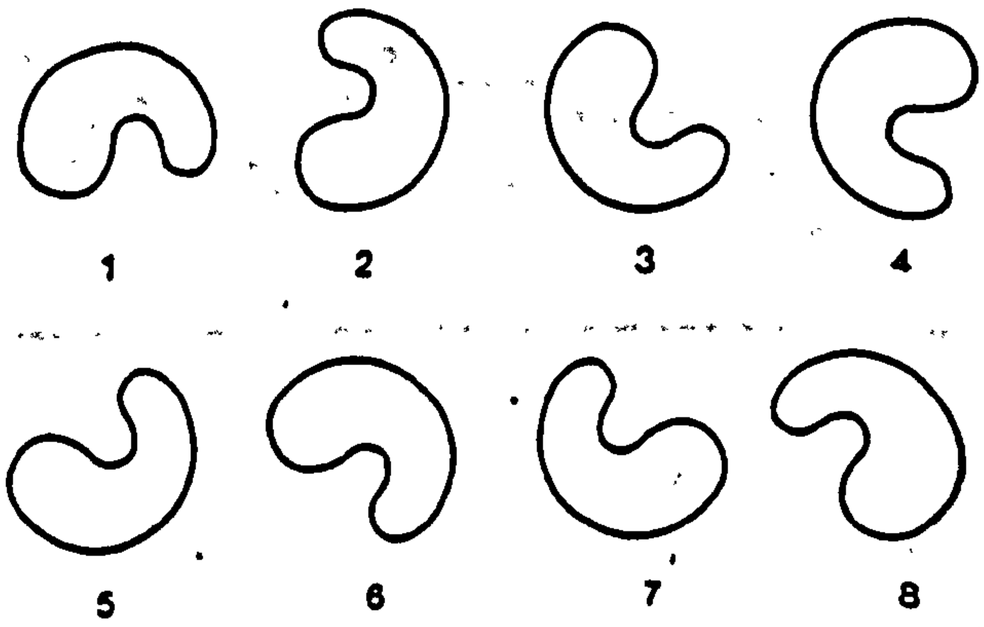

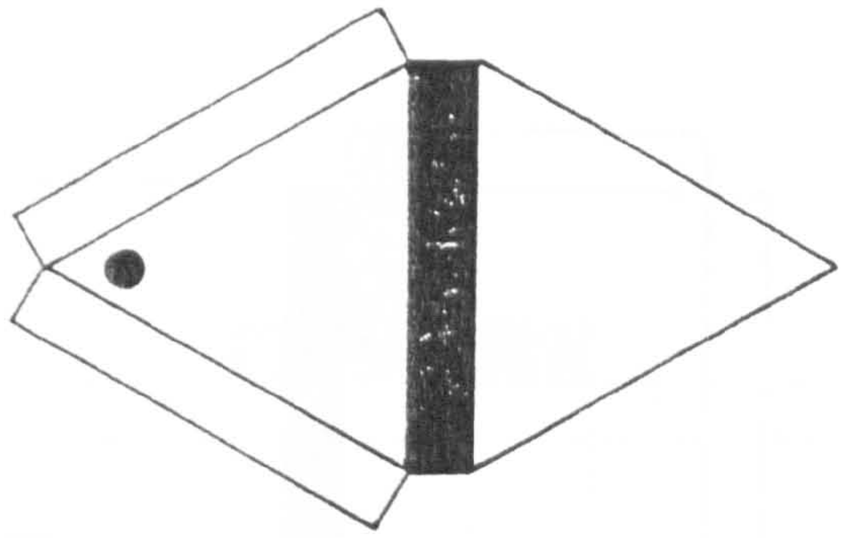

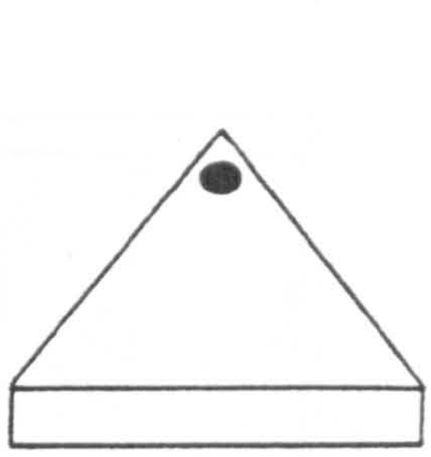

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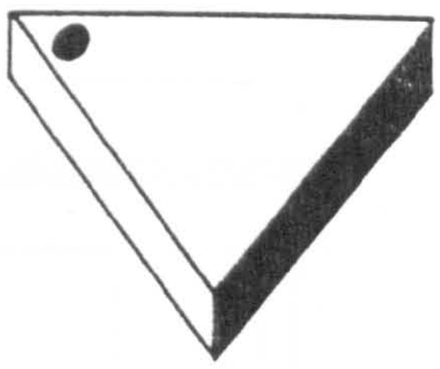

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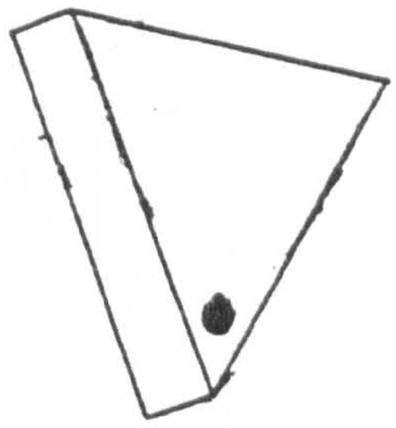

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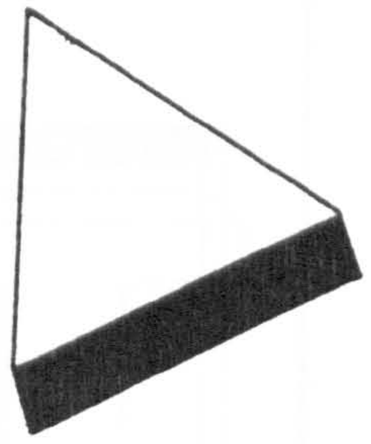

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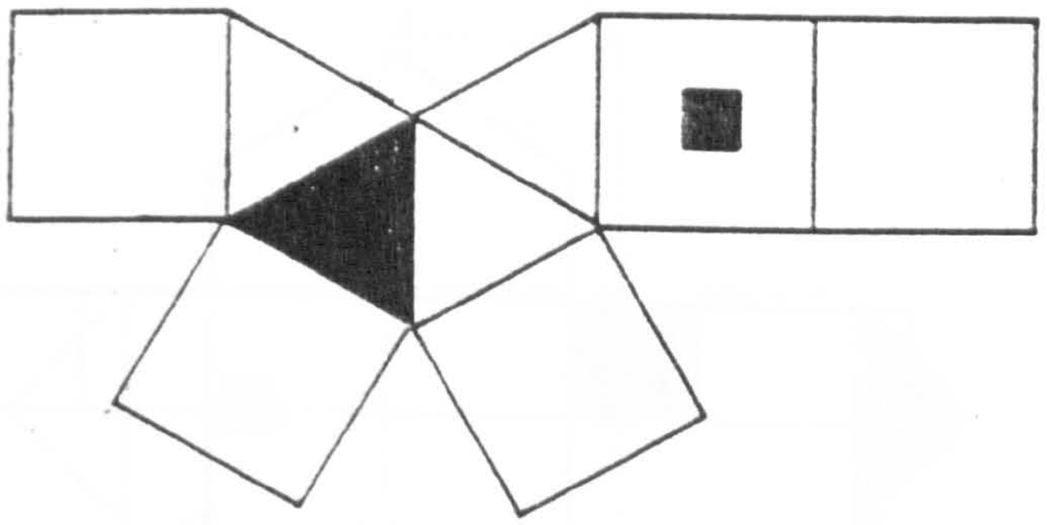

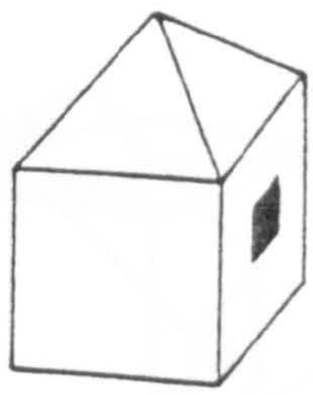

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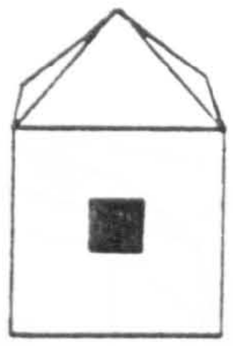

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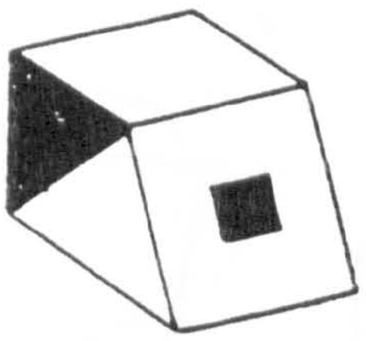

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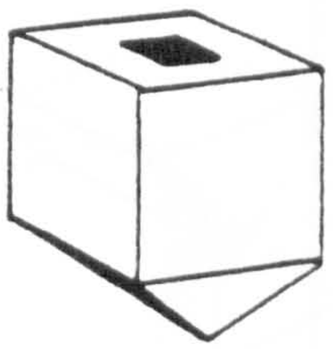

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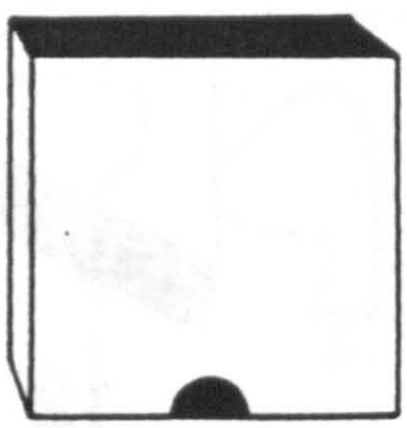

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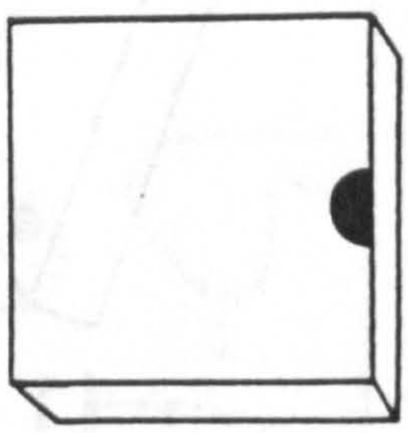

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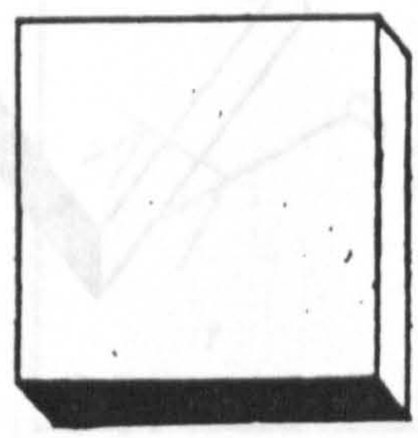

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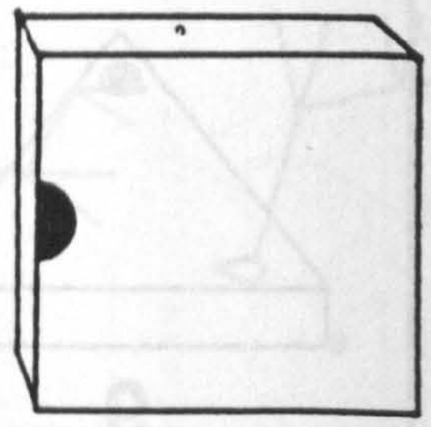

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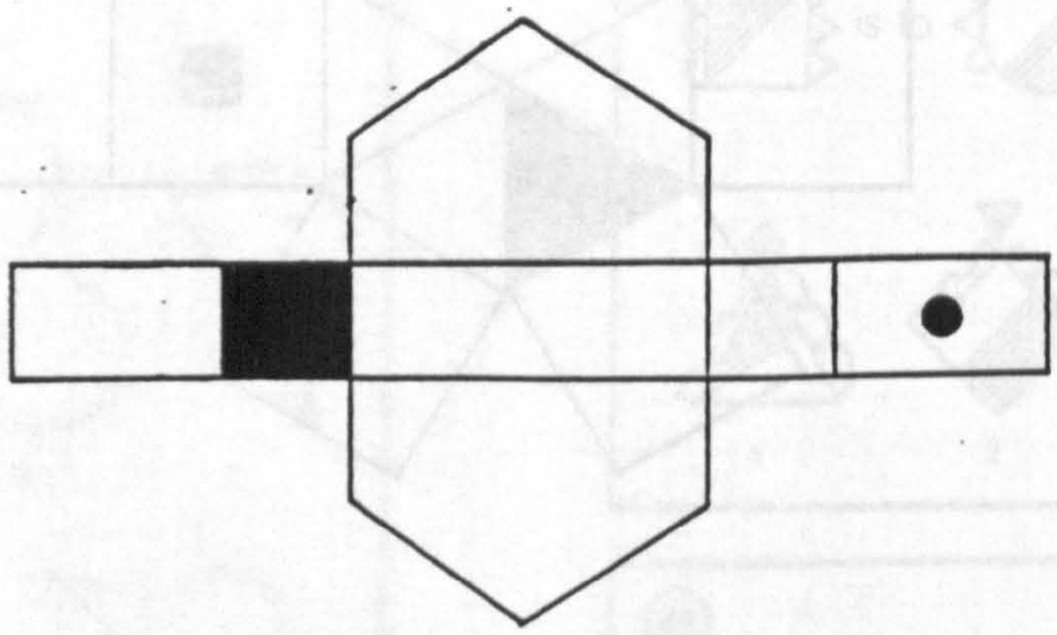

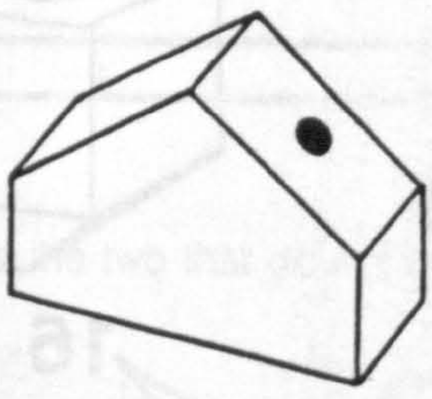

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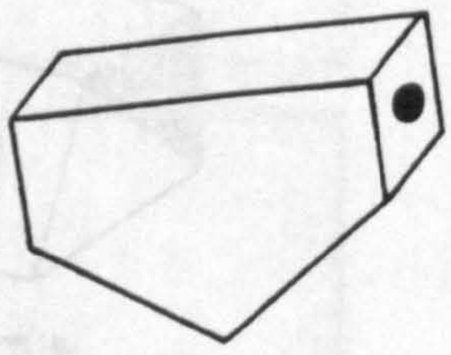

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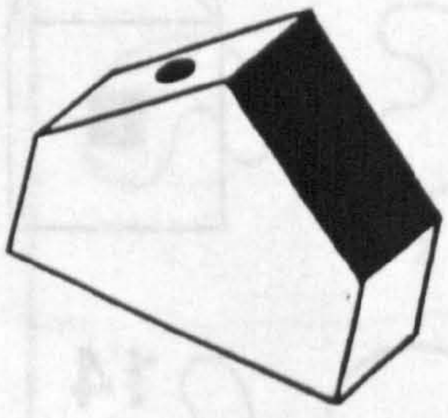

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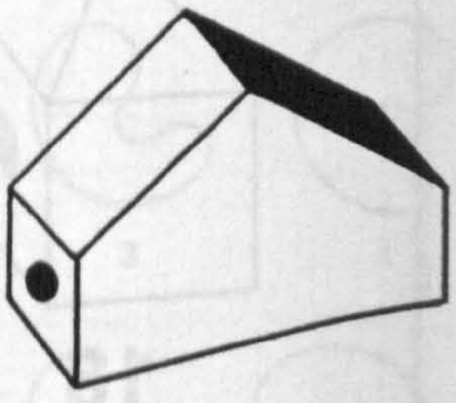

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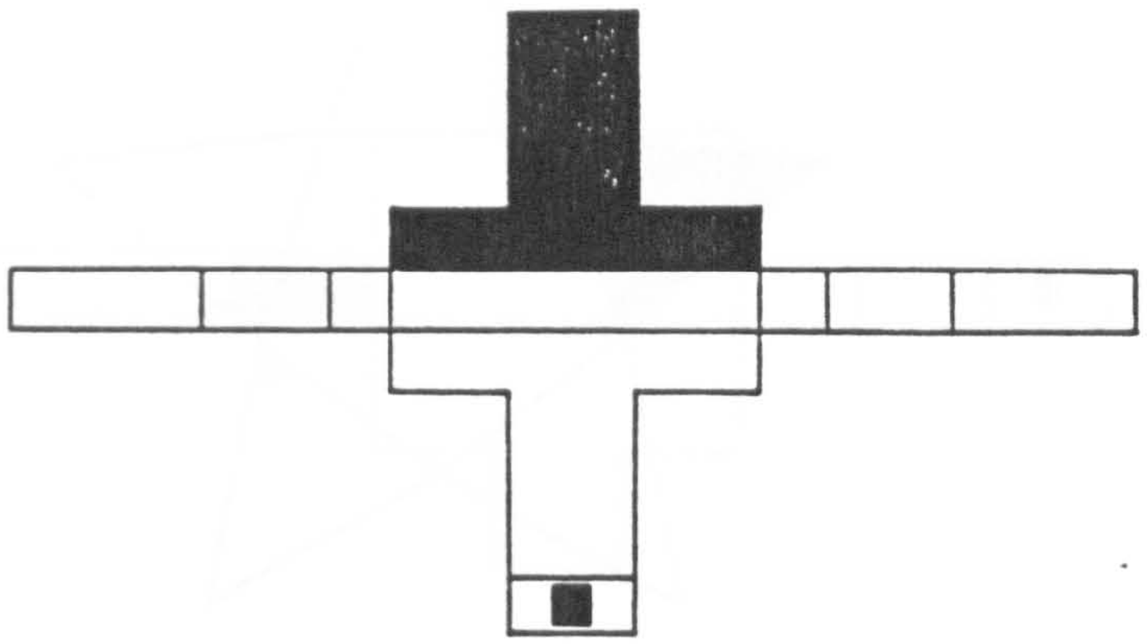

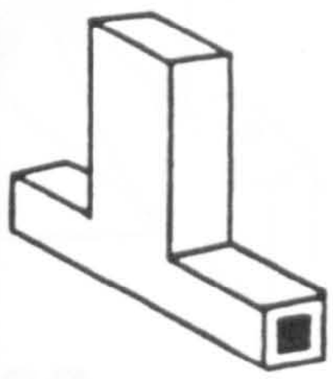

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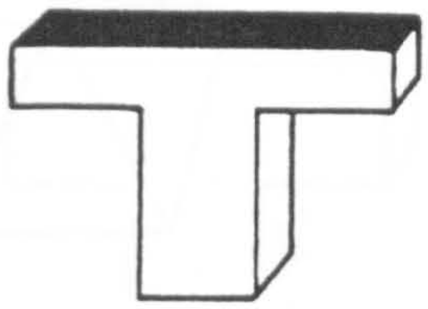

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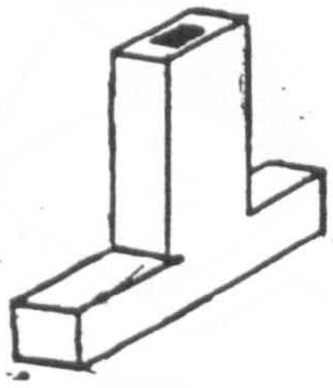

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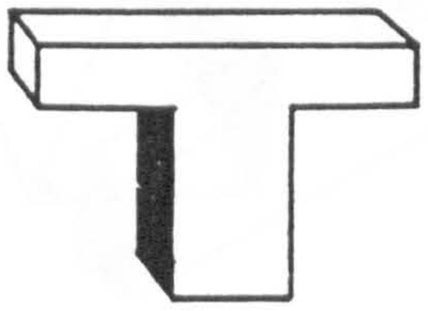

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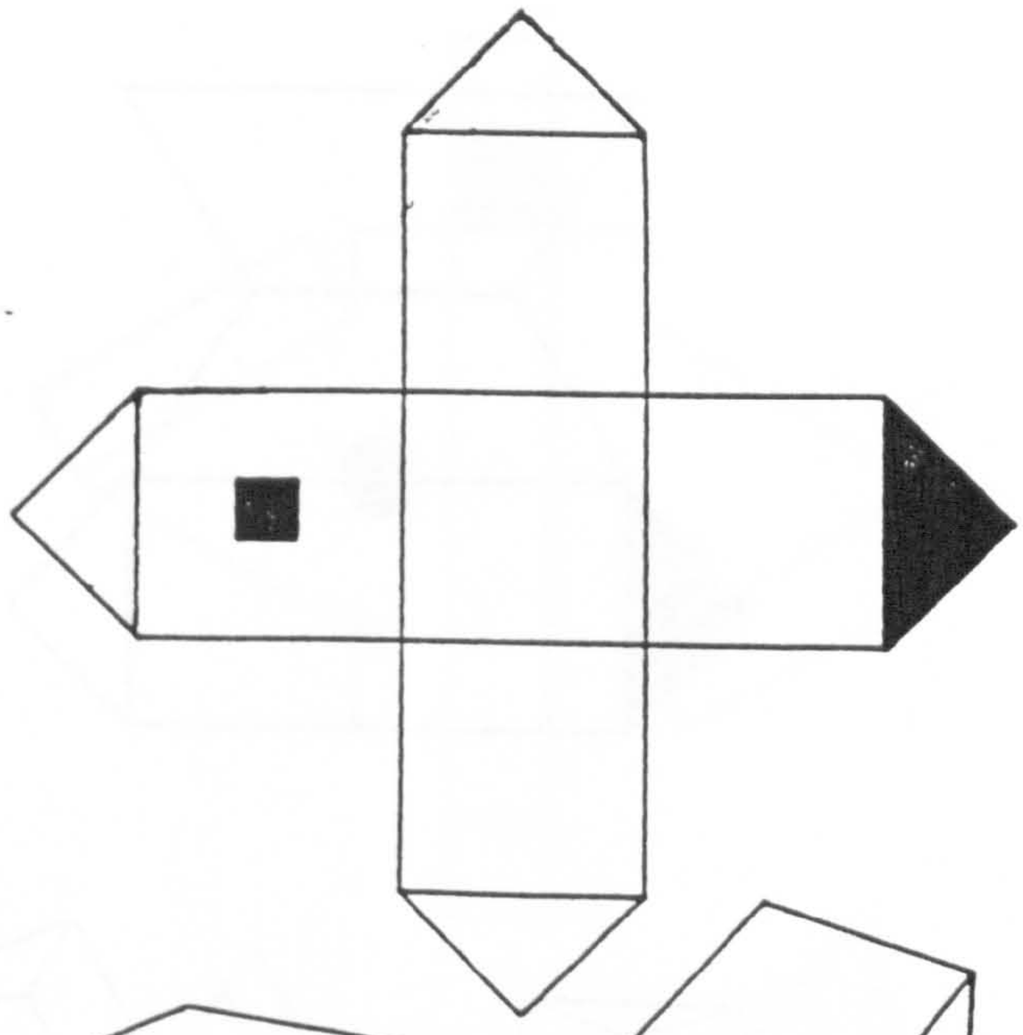

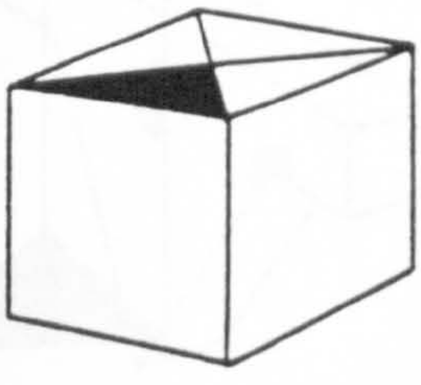

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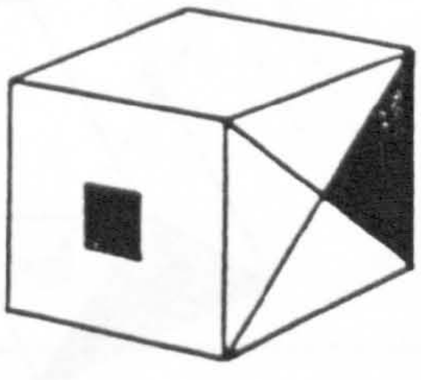

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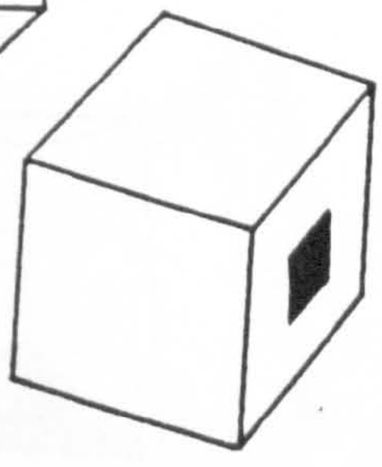

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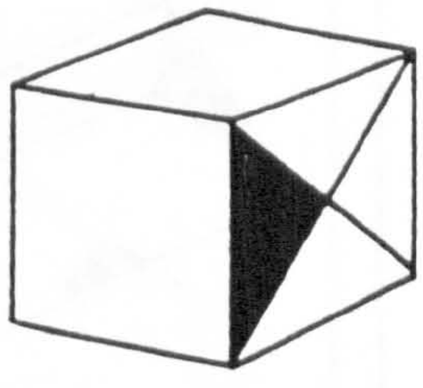

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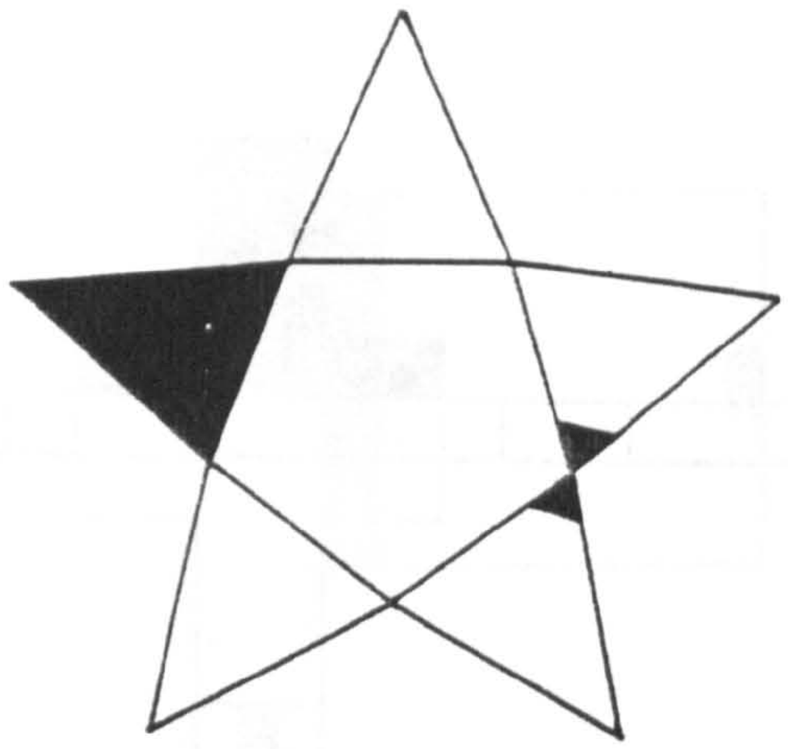

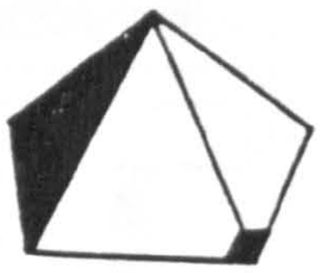

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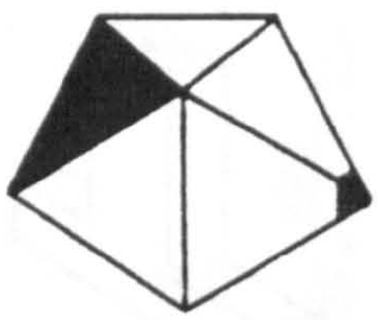

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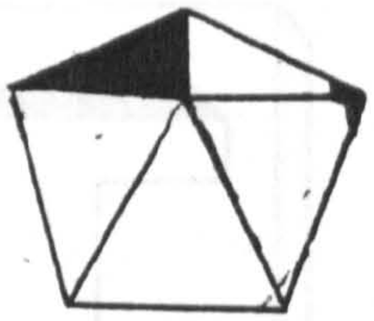

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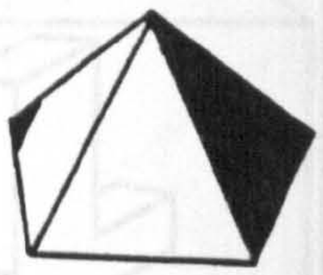

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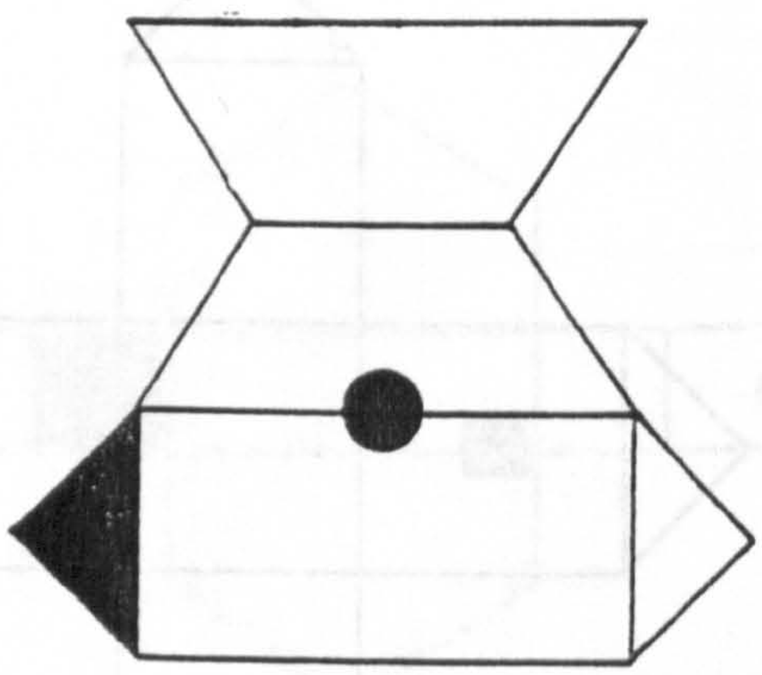

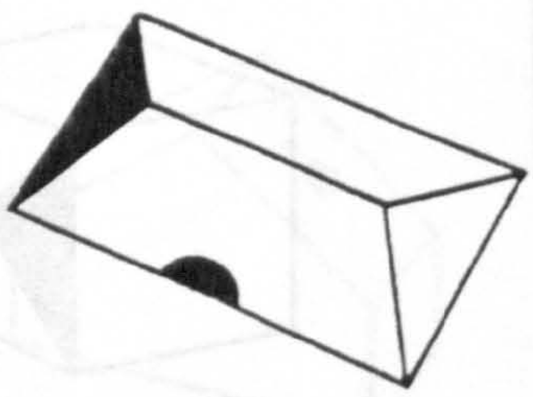

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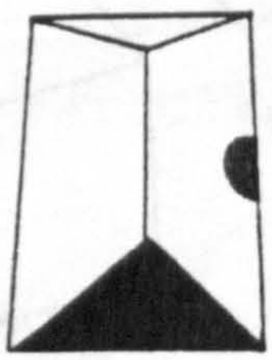

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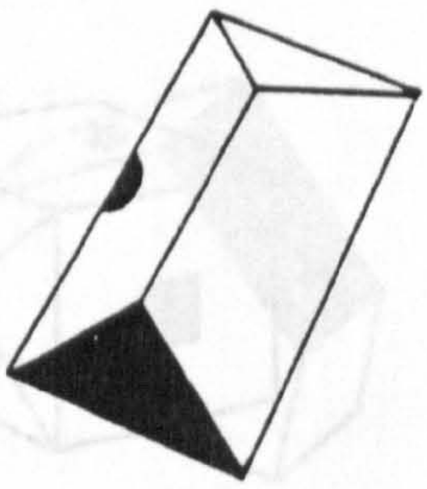

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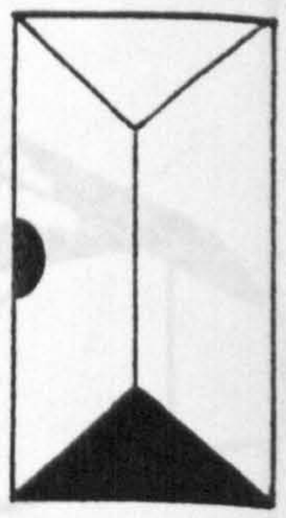

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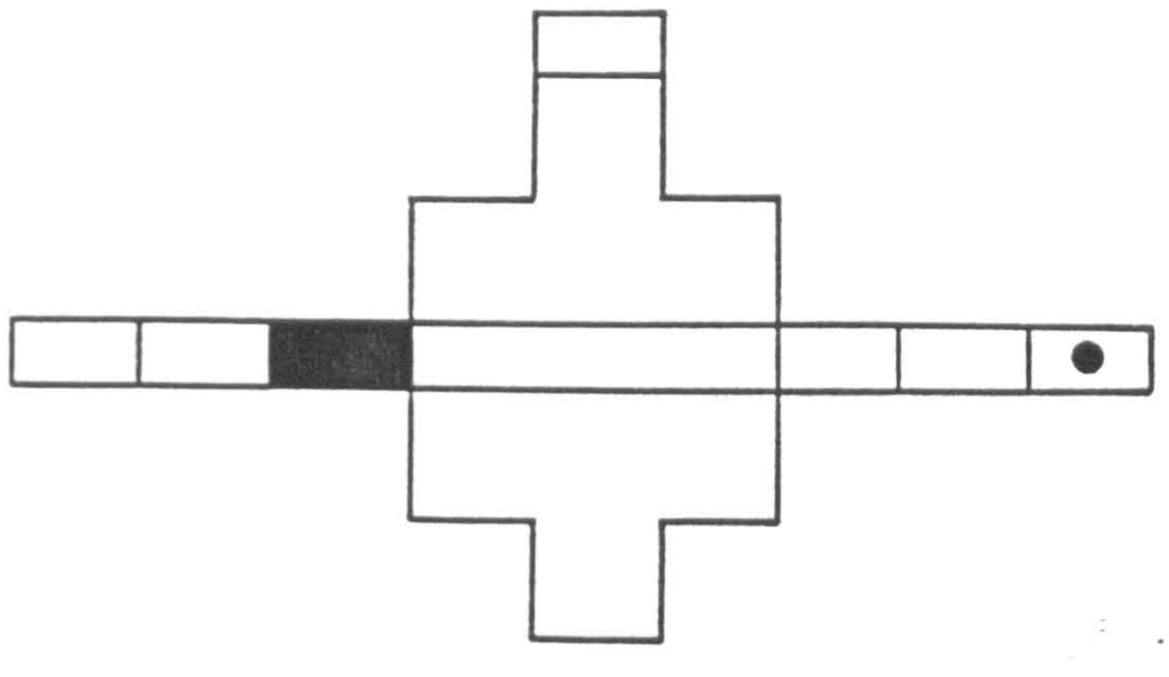

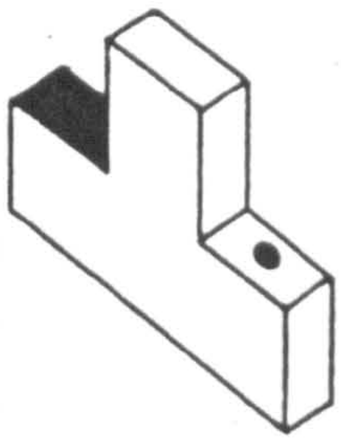

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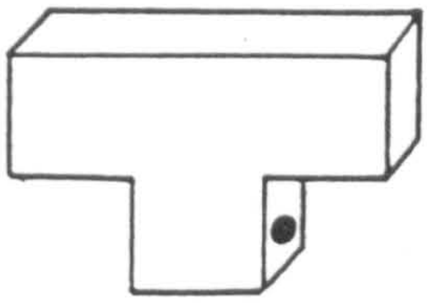

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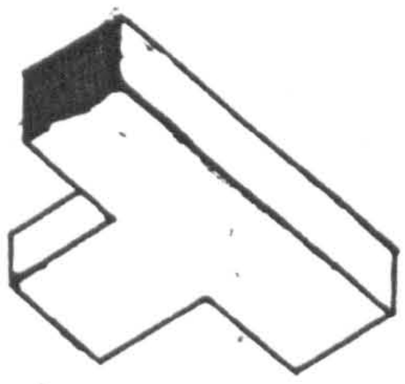

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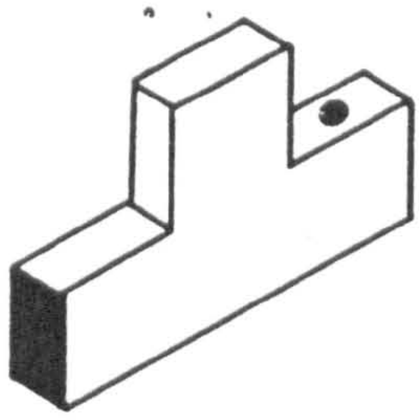

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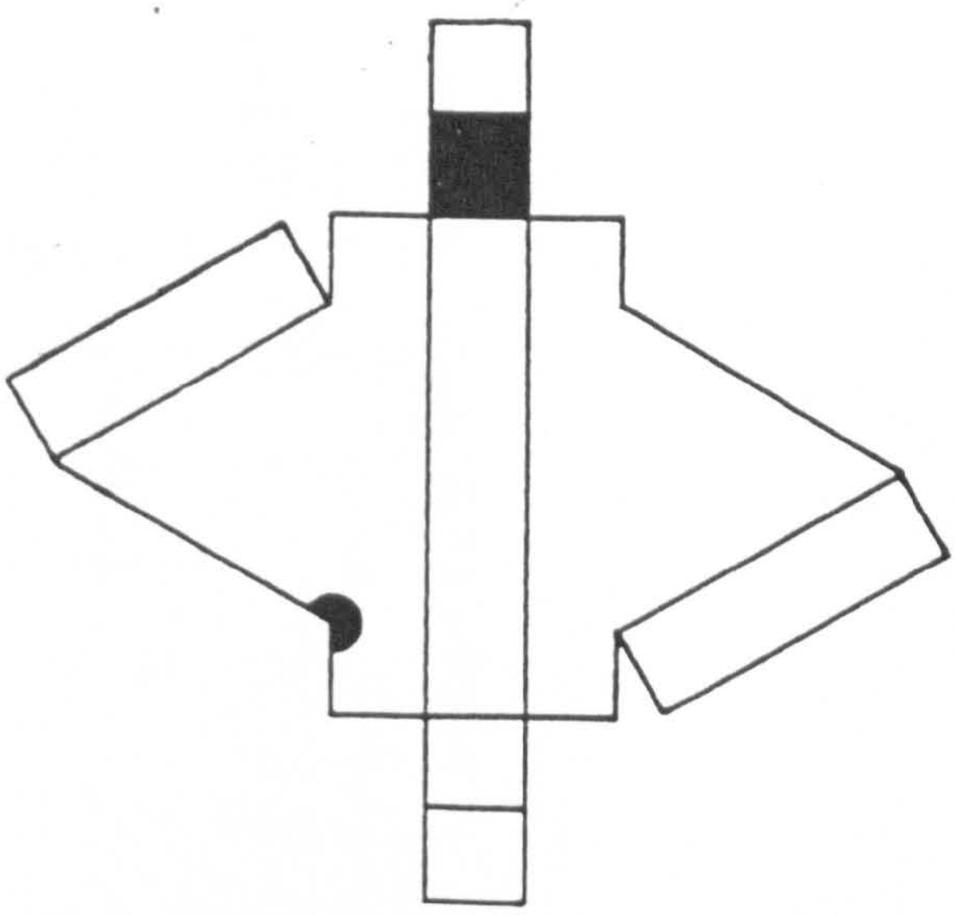

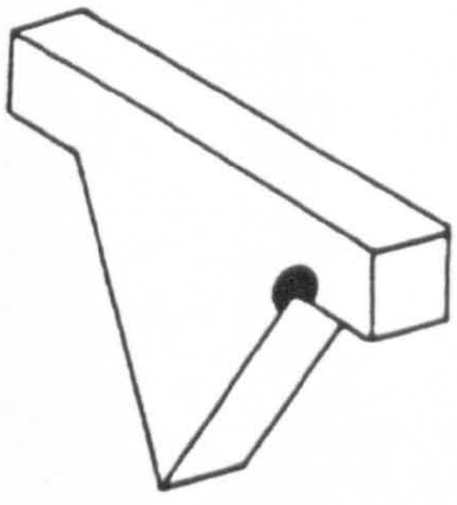

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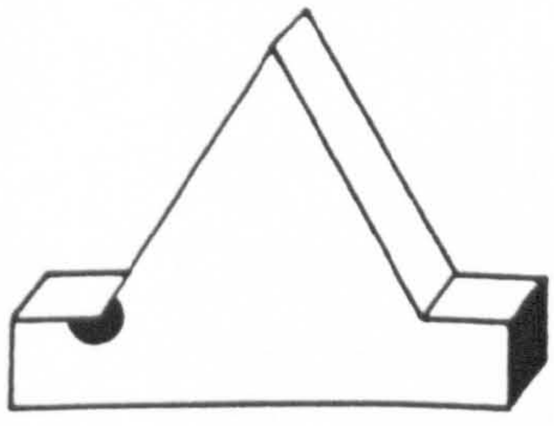

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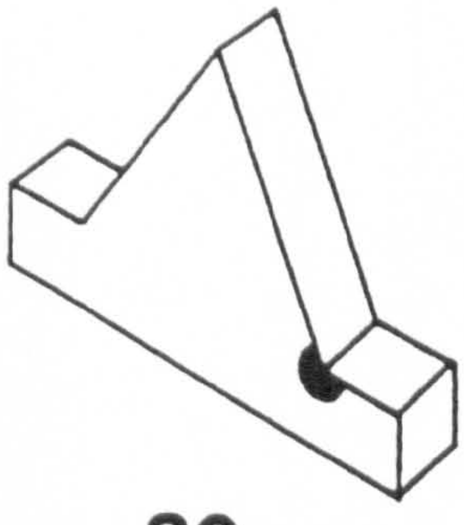

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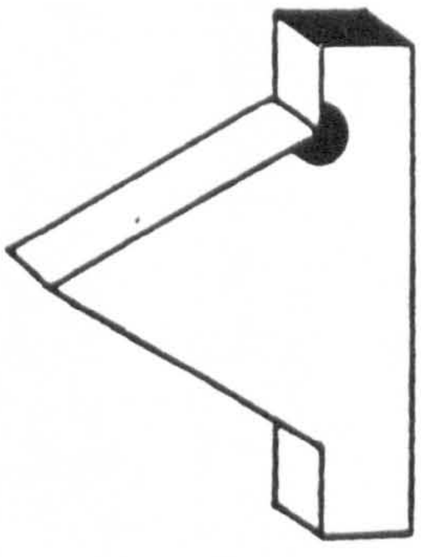

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APPENDIX H

PIG HEALTH & DISEASE TOPICS - Questionnaire for Course attenders

You have just attended a two day course on pig health and diseases and a short questionnaire has been prepared to assess the benefits of this training.

This form is TOTALLY CONFIDENTIAL and the information collected will only appear as unnamed data in a thesis for the University of Nottingham. This work is very important for the future planning of training days for experienced stockmen like yourselves.
(Please cross out the response to a question that does not apply)

Do you think that you now have more knowledge to spot the unhealthy pig? (Please score your assessment of your knowledge before and after the course using a 'X' on the line between 0 and 5)

```
0                5
*----------------*  before the course
*----------------*  after the course
```

Do you now understand how disease gets into the pigs themselves? Yes/No

Do you perform any of the following operations on the unit ? Yes or No. (after each operation would you please give yourself a score between 1 and 10)

eg. Do you drench pigs? Yes/No (6)

Do you castrate pigs ? Yes/No ( )
Do you inject pigs ? Yes/No ( )
Do you tail dock the pigs? Yes/No ( )
Do you teeth clip the pigs? Yes/No ( )
Do you use ear tattooing ? Yes/No ( )
Do you foot trim the sows? Yes/No ( )

Assess your level of knowledge and skill on the following topics using the scales provided.

```
                                        0                5
Importance of observation               ----------------  Before
                                        0---------------5  After
Importance of reducing stress            ---------------  Before
                                        0---------------5  After
Reducing the spread of disease           ---------------  Before
                                        0---------------5  After
Appreciate importance of immunity        ---------------  Before
                                        0---------------5  After
Appreciate benefits of closed herd       ---------------  Before
                                        0---------------5  After
```

CONDITION SCORING

How confident are you of condition scoring correctly? Please put your own assessment of your ability to score on the following scale

```
0                 5
*-----------------* after the course
*-----------------* before the course
```

(if you had no experience before then score 0 and comment no experience)

"Feeding seems to be the key to condition and sow productivity". Do you feel that you can now feed correctly to achieve the required condition? Please score your feeding skills on the scale provided.

```
                    0                   5
after the course    *-----------------*
before the course   *-----------------*
```

INFERTILITY IN PIGS

Would you please tick the factors that you are sure that you can influence on your unit. Would you then assess your confidence level to achieve success in all these areas.

	TICK	CONFIDENCE LEVEL Between 0 and 10
Correct supervision of services or AI		( )
Correct feeding of sows		( )
Correct weaning procedure		( )
Boar use and management		( )
Eliminate stress - fighting,bruising crushing, good floors		( )
Worming/Mange Dressing		( )
Culling Policy		( )
Ensuring gilts are served at correct time		( )
Environment - seasonal changes in fertility due to		( )
a) weather - environmentally controlled house		( )
b) light		( )
c) service area		( )
d) temperature		( )

The problem may be due to the BOAR PERFORMANCE. Please check the following list and tick if correct and then assess your unit with regard to the importance of the problem on a scale from 0 - 5 where 0 = no problem to 5 = great problem.

	TICK	PROBLEM SCORE
Failure to feed properly		( )
Need to serve each sow three times		( )
Is the sow really on heat?		( )
Does sow smell of another boar		( )
Boar recently fed		( )
Boar overworked - boar:sow ratio		( )
Boar infertile		( )

BOAR CARE & EFFECTIVE SERVICE

The boar is 25%, 50%, 75% of the herd in terms of importance. (cross out the % not applicable).

The boar should be brought into the sow pens ? True/False

Boars should not be fed less than 16% protein rations? True/False

Please assess your skills at the following tasks after the course; (circle the level of skill that you think applies to you)

	No Experience				Fully experienced
a) Do you take temperatures ?	0	1	2	3	4 5
b) Do you do any foot-paring ?	0	1	2	3	4 5
c) Do you inject sows & boars with vet's guidance ?	0	1	2	3	4 5
d) Do you footbath sows/boars ?	0	1	2	3	4 5
e) Do you condition score sows?	0	1	2	3	4 5

How good are you at detecting heat? Average Excellent
(please put a cross on the line) 5----------10

Are the service facilities adequate on the unit ? Yes/No

If "No" then what problems do you find ? Poor pen pdesign, size, too many corners, floor is poorly drained/ surfaced/ insulated, partition is too low, troughs and drinkers stick out of the wall. (Cross out the incorrect answers for your unit).

REDUCING PIGLET MORTALITY

. How do you ensure that the sows have adequate milk supplies ? Check the list below and TICK those measures that you use on your unit. Assess your confidence to use these measures on a scale of 0 ---- 5 before and after todays session.

	TICK	SCALE of CONFIDENCE	
Correct feeding in pregnancy		Before	0----------5
		After	0----------5
Correct management to avoid MMA		Before	0----------5
		After	0----------5
Condition scoring		Before	0----------5
		After	0----------5
Culling policy		Before	0----------5
		After	0----------5

Would you please assess you confidence to recognise the problems and ability to deal with them -- before you came on the course and afterwards.(Score 0 - 5 cannot recognise to easily recognise and 0---5 on ability to deal with problem before and after course)

	(0 -- 5)Recognise	(0 -- 5)Ability	
		Before	After
Splay legs	( )	( )	( )
Sealed anus	( )	( )	( )
Bleeding navels	( )	( )	( )
Scour	( )	( )	( )
Meninigitis	( )	( )	( )
Joint ill	( )	( )	( )
Anaemia	( )	( )	( )

PRACTICAL GILT SELECTION

Too many sows die or have to be culled before they become profitably productive. How many sows on your unit are culled before they reach 4 - 6 litters? 2%, 10%, 20%, 25%. (Circle the closest figure)

What would you look for in the selection of gilts?(Tick the important factors and score your ability to assess these features on a scale 0-6)

Performance	TICK	0-6	Appearance	TICK	0-6
Parents of gilt		( )	Fatness of the carcase		( )
Weight for age		( )	Sound legs		( )
MLC Test index of merit		( )	"Weakness" in conformation		( )
F.C.R.		( )	Poor stance		( )
Temperament		( )	Six-teats each side		( )

How many litters do you normally cull sows? 4, 5, 6, 7, 8. (Circle the answer that is either the unit policy or normally occurs)

What is the main reason for culling sows? (tick the answers and tick again the main reasons for culling on your unit- assess on a scale 0-5)

	TICK problem	TICK problem for your unit	Control of Stockman (confidence)
Lameness			
Mis-mothering			
No milk/ shortage			
Old age			
Paralysis			
Poor progeny			
Reproductive failure			
Udder problem			
Mange			
Tail- biting			

AIMING AT MAXIMUM CONCEPTION

The most usual reasons for long weaning to service time are:
Failure to come in oestrus promptly and
Failure to detect heats
Indicate on the scale your confidence Before 0----------10
the course to detect heat in sows.
After the course 0----------10

. Would you please score your level of knowledge concerning maximising conception , to increase the level of successful services leading to high conception rates. (Please score on the scales given with an "x" to show your level of knowledge before and after the course)

		No Knowledge Very Knowledgable
eg Assess boar fertility	Before	0----------10
	After	*----------*
The causes of high "WASTED DAYS"	Before	0----------10
	After	*----------*
The calculation of "WASTED DAYS"	Before	0----------10
	After	*----------*
The cost of loss of production	Before	0----------10
due to "WASTED DAYS"	After	*----------*
The detail of the reproductive	Before	0----------10
process	After	*----------*
The factors affecting boar	Before	0----------10
fertility	After	*----------*
The ideal time for copulation	Before	0----------10
	After	*----------*
The need for so many sperms	Before	0----------10
	After	*----------*
The working of the oestrus cycle	Before	0----------10
	After	*----------*
The need good observation &	Before	0----------10
management	After	*----------*

DISEASE CONTROL & PREVENTION

What is the cost of disease to pig producers? (Please TICK if relevant and number in order of importance 1 - 5)

	TICK	Order of Importance
Deaths of pigs/sows/boars		( )
Loss of liveweight gain		( )
Poor food conversion ratio		( )
Lower breeding performance		( )
Increased drug costs		( )

Are drugs the answer to your disease problems? Yes/No
If "No" then why not? _____
_____

.Do you keep records and use them for reference? Yes/No

.What use should we make of records? Assess your level of confidence at using the records to do the following score 0 - 5

	0 5	
Planning/Checking production	*----------*	Before
	----------	After Course
Reproduction data	*----------*	Before
	----------	After Course
Monitoring disease	*----------*	Before
	----------	After Course
Check food conversion ratios	*----------*	Before
	----------	After Course

APPENDIX I

The farmer's view of recruiting pigmen

No matter what may be found out about the availability of good pigmen or women on the labour market from studies of educational trends, etc, what really matters to each and every pig farmer is being able to satisfy his own requirements for staff.

Much of his success will depend on where his unit is located. In some parts of the country, such as the south and south east, the job market is far more bouyant than in the north and potential recruits to our industry are invariably attracted to higher paid, cleaner jobs offering more regular hours.

A pig farmer's reputation as a good or bad employer also has an impact upon his ability to recruit and keep staff. One only has to watch the appointment sections of national farming magazines and local papers over a period of months to identify units where a personnel problem obviously exists. Prospective employees are able to put two and two together about such units and decline to apply for positions on offer by such employers.

Obviously, from time to time most pig units are forced to advertise positions as existing staff retire or leave. How the position is advertised has an effect on the number of applications – the benefits offered must be clearly stated.

Local recruitment

Most recruitment for the lower echelons of a pig unit's staff is carried out on a local basis. This may be through an advertisement in a local paper or from word of mouth. However, finding a replacement manager may necessitate using a national recruitment agency or advertising in a national farming magazine.

The number of new staff that have to be found over, say, a year will vary according to the size of a unit, how good an employer the owner is and the availability of other, often better paid, employment within the locality.

In some parts of the country, obtaining men or women to work in specific sections of very large units is becoming very difficult. If people are expected to do the same routines day in, day out, it can become very monotonous, whereas on the smaller units there is a greater variety in the job.

Of course, losing one man from a workforce of 20 or more is not so critical to the operation of the enterprise as it is when one out of two or three men leave. Thus, the pressure to find a replacement is far greater on a smaller unit.

Many larger units are now relying to an increasing extent on taking school-leavers straight into their workforce and undertaking the training themselves.

has 3,200 sows and gilts plus their progeny to bacon weight in four units and employs a manager, assistant and a total of 26 pigmen.

Trainees from school

He has established a natural progression in responsibility on the units, with young lads (usually straight from school) being taken on as trainees. "We are presently finding that we are being approached by more young people than we have positions for. However, five or six years ago it was a different matter – there didn't seem to be so many youngsters around who wanted to work with pigs," he explained.

At any time there are three or four trainees working within the enterprise. During the first six months or so they are put onto the more menial tasks where they do not require so much training or understanding. They then move on to working with a more experienced pigman doing such two-man tasks as castration, teeth clipping, tattooing, feeding, etc.

Depending upon the person's ability and progress, at the end of the six-month period they can become relief pigmen if a position is available. Then, once a full time pigman's position becomes available, they move up into this slot.

"It is our belief that you have got to get the young person away from simply being a lavatory attendant as quickly as possible. The industry has enhanced the status of its employees significantly by the use of slats and the machanisation of many of the previously manual tasks on units. There is now less physical effort required and far less repetition in the job," stressed Mr. Control

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Much of the learning for young recruits takes place on the unit. From time to time, specific health, veterinary and other courses are run on the units, while the senior personnel involved in the management structure of the units have all attended man management courses run by the Agricultural Training Board.

Finding new members of staff for the four . Farm units has eased because of the national unemployment position, although East Anglia has been fortunate to have a lower percentage of its working population unemployed than other areas. "Whereas a few years ago there was a resistance by young people to enter the farming industry, there now seems to be a greater realisation that farming does offer a reasonably stable employment situation, especially in the livestock sector," Mr. Control points out.

Although people working with livestock are expected to show a high level of dedication to the job and exhibit a caring attitude to the animals within their charge, job satisfaction alone is not enough to motivate people these days.

"The only way to attract people is to pay good wages. The only way pig farmers can afford to pay more is to increase productivity and invest capital to utilise labour saving mechanised systems. Remember, the pig industry does not receive grants and the tax situation is not helping us.

"The next few years will tell whether there is going to be enough profit from pig production to enable us to make the necessary level of investment and to continue to pay realistic wages. The welfare lobby could put significant pressure on pig farmers by pushing down the number of animals that a man can look after. Unless we then obtain better prices for our pigs, we are not likely to be able to afford to make the level of financial commitment to our units that may really be necessary," warns

New and existing members of staff need to be stimulated to maintain their interest. Consequently,

a bonus scheme is operated linked to output. Each unit is operated separately to create a degree of competitiveness among the staff and bonuses are paid according to the number of pigs reared to eight weeks, plus the number of pigs finished at less than 190 days and how they grade.

The latest trough in pig profitability has led to some easing of the shortage of good pigmen as some units have closed down. However, there still seems to be an underlying long term problem in the industry - we are just not stimulating sufficient young people to work with pigs.

With the suggestion that livestock units or the men operating and managing them should be licenced, will this put even more pressure on providing satisfactory labour? For certain, such a move will lead to the need to employ people with a least a minimum level of further education.

The next decade will undoubtedly bring many changes for our industry. Not least of these is certain to be the problem of recruiting suitable people to operate units and contend with the other pressures created by groupings from outside the industry. ■